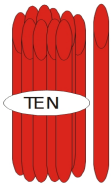
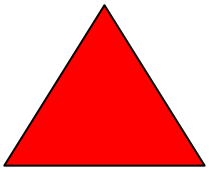
LET US UNDERSTAND MATHEMATICS
KG and CLASS 1





Harinder Mahajan Ph.D
Research Scientist(Retired)
Delhi University

PREFACE

This is the first of a series of books based on the NCERT syllabus and research on the teaching of mathematics. As in India most schools do not have Kindergarten. This book is based on the syllabus for both the classes. The teacher in the schools that have kindergarten can decide what to cover in kindergarten and class 1. Teachers in the schools that do not have kindergarten can go at a faster pace as the students there are older(5 years). The focus here is on an understanding of concepts and procedures. The concepts and procedures are presented by manipulatives, pictures, real-world situations, spoken and written words and symbols and videos that enhance their learning. Opportunities are provided for communication, translation from one mode to another and applications to daily life. The teachers should use manipulatives that are available or can be made and use situations for exercises that are familiar to the children in the class.

As the schools in developing countries have paucity of resources, we will use sticks for activities with number concepts. The sticks can be replaced by abacus or unifix cubes.

The schools that can afford should provide materials such as counters, unifix cubes, pattern blocks, geometrical models, geoboards, fake money, and use these for explaining concepts and procedures. Or teachers can make models of different 2-D and 3- D shapes using cardboard and use dot paper instead of Geoboard. The students can be asked to bring buttons, scissors, and empty boxes, containers of different shapes and sizes from home.

All children should at least have 100 sticks of the same length and rubber bands(they can buy pop sticks or toothpicks) and dot paper.

As for most teachers, the textbook is the curriculum. This book is a teaching guide cum workbook for students. As the children have not yet developed the reading skills, the concepts, operations and word problems should be learnt and tested orally first. The exercises with manipulatives and oral work are included to facilitate that.

Some activity sheets are also provided that can be printed and used by students.

TABLE OF CONTENTS

Unit 1. Identification and Comparison of Attributes 3

Unit 2. Concept of Numbers 1-5 12

Unit 3. Concept of Numbers 6-9 25

Unit 4. Comparison of Numbers 1-9 38

Unit 5. Concept of Addition 42

Unit 6. Concept of Subtraction 49

Unit 7. Time 57

Unit 8. Concept of Zero and Numbers 10-20 59

Unit 9. Concept of Place Value 67

Unit 10. Geometry 76

Unit 11. Addition Facts 82

Unit 12. Subtraction Facts 91

Unit 13. Measurement 102

Unit 14. Numbers 1-100 107

Unit 15. Money 125

Unit 16. Collection and Organisation of Data 134

Unit 17. Patterns 138

Activity Sheets 143

UNIT 1

Identification and Comparison of Attributes

Give or show students pattern blocks, buttons of different colours, shapes and sizes and ask them to

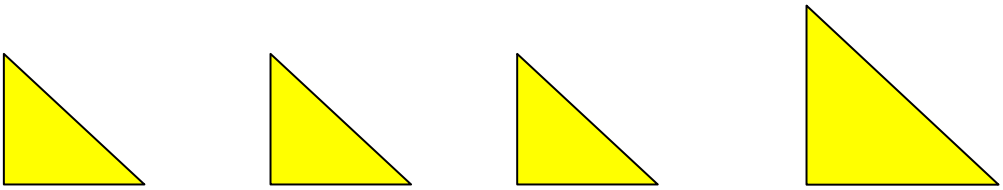
1. Describe a block or button.
2. Tell how two blocks or buttons are alike?
3. Tell how two blocks or buttons are different?
4. Sort the blocks or buttons that are similar in some way and tell how they are similar?
5. Can you sort them so that they are similar in a different way?
6. What things do you need to sort at home? (Clothes after washing, vegetables, fruits and groceries after shopping etc.)

Concept of colour, shape and size

1. Mark an X under the picture or drawing that is different in each set and tell how?

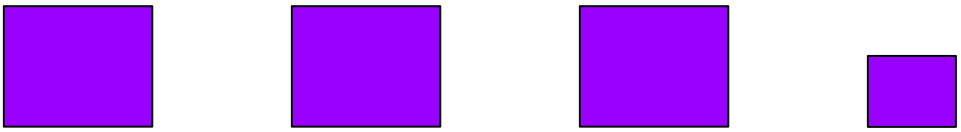
2. Mark an X under the picture or drawing that is different in each set and tell how?

3. Mark an X under the picture or drawing that is different in each set and tell how?

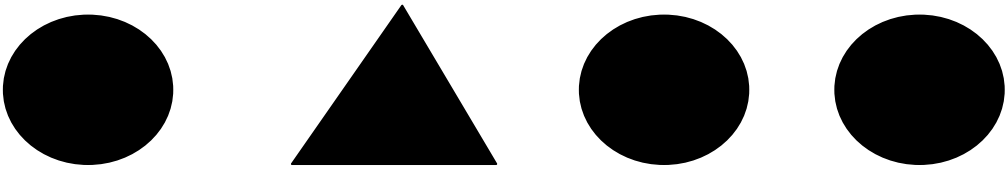


4. Mark an X under the picture or drawing that is different in each set and tell how?

5. Mark an X under the picture or drawing that is different in each set and tell how?



6. Mark an X under the picture or drawing that is different in each set and tell how?



Cut and sort the shapes given in Activity Sheet 1.1 according to colour and paste figures with the same colour in different columns(explain what is a table, column, row and cell by showing examples) in the table given below:

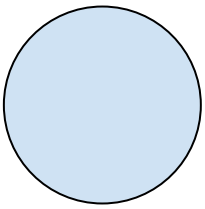
5. Cut and sort the shapes given in Activity Sheet 1.2 according to shape and paste figures with the same shape in different columns in the table given below:

1.2 Identification of colours, shapes, and positions

Colours

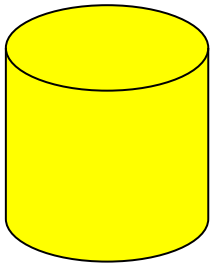
The teacher gives many examples and non-examples of different colours.
The names of colours of some objects are given below:

Red



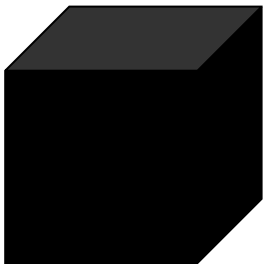
Blue

Green



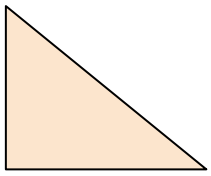
Yellow

Purple



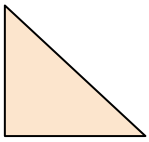
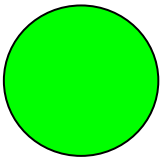
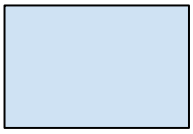
Black

Orange

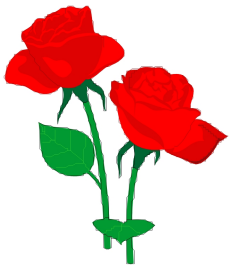


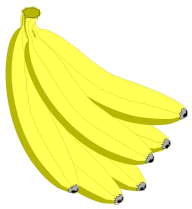
Pink

1. Name the colour of the following:

2. Name the colour of the following:





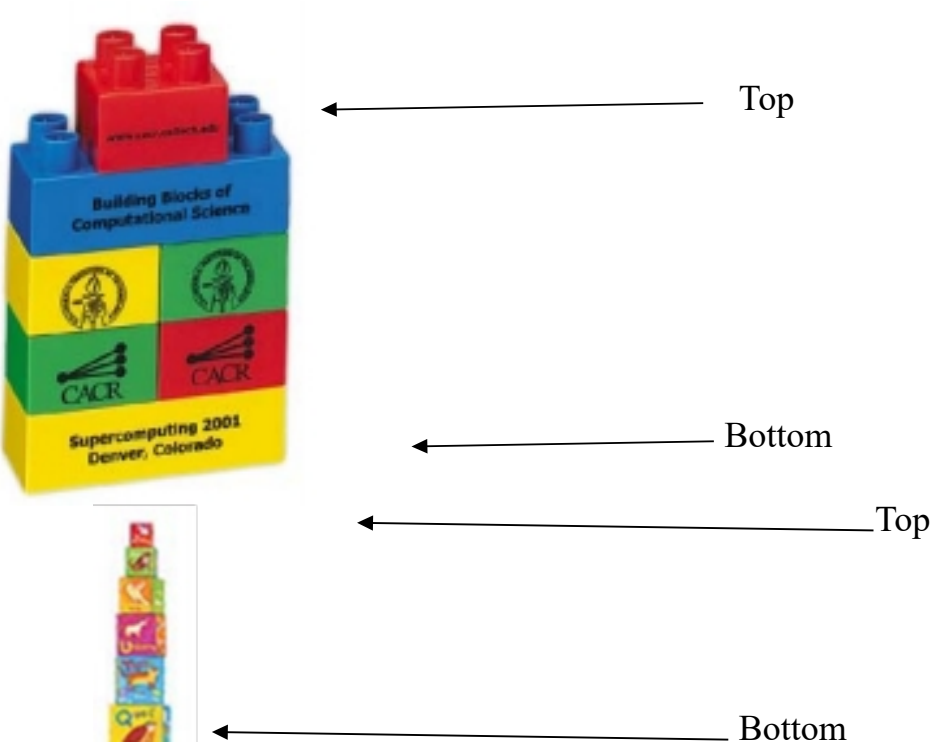
3. Name the colour of the following:
   (a) grass
   (b) sky
   (c) tomato
   (d) mango
   (e) black board
   (f) walls of your classroom
4. Name some objects that have the colours given below:
   (a) orange
   (b) red
   (c) green
   (d) purple
   (e) blue

(f) yellow
(h) white
(i) pink

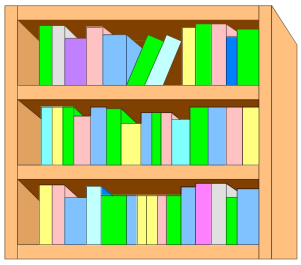
Concept of Position

Watch the video: https://youtu.be/0YtJUIcxYss
The teacher gives many examples of different positions and asks the students to do questions like the ones given below.

Top and bottom



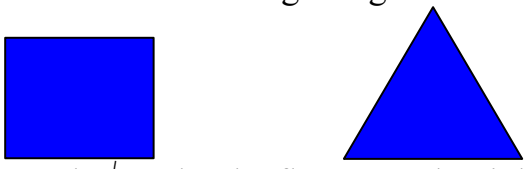
1. Make a tower of blocks and show the blocks at the top and bottom
2. Make a pile of notebooks and show the notebook at the top and bottom of the pile.
3. Write a T against the top and B against the bottom shelf of the shelf given below:



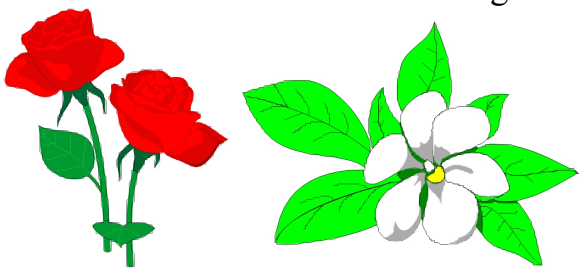
Left and right

The teacher explains the concept of left and right and asks the students

1. Show your left hand.
2. Show your right hand.
3. Tell the name of the child sitting on your right.
4. Tell the name of the child sitting on your left.
5. Is the door in the classroom on your left or right?
6. Mark √ under the figures given below on the left.

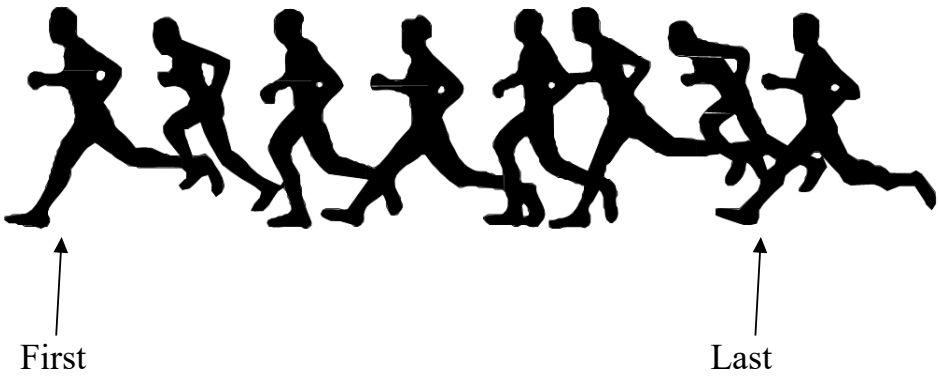


7. Mark √ under the flower on the right.



First and last

When people or things are arranged in order one ahead of all or in the beginning is called **first** and the one behind all or in the end is called **last**.



1. Show the first line of a page in your book.
2. Show the last line of a page in your book.
3. Name the first and last child in a queue of children.

Similarly, explain and test spatial relationships between objects such as **on** and **under**; **inside** and **outside**; **near** and **far**; **before** and **after** using objects in the surroundings.
The teacher may ask questions such as
Where is the duster? (It is on the table).
Where is the duster(teacher may keep the duster under the table)?(It is under the table)
Whose desk is nearer the teacher's table (name two students)?
Which is farther from the classroom (school library or principal's office)?
In a queue of students, name the student that comes before or after a particular student.
In a row of blocks, name the colour of the block that comes before or after a particular block.
Give examples of persons and objects that are inside the room?
Give examples of persons and objects that are outside the room?

UNIT 2

Concept of Numbers 1 to 5

Concept of one

Show the video: https://youtu.be/pzmB0GoEKkA
(Show the video up to number 5 or pause the video after each number until they have traced the number.)
Or the teacher can show how to write the numbers)

These are pictures of one animal. We write one like this - 1

1

1

1

Trace 1 in each cell:

1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1

Concept of two

These are pictures of two birds. We write two like this-2.

2

2

2

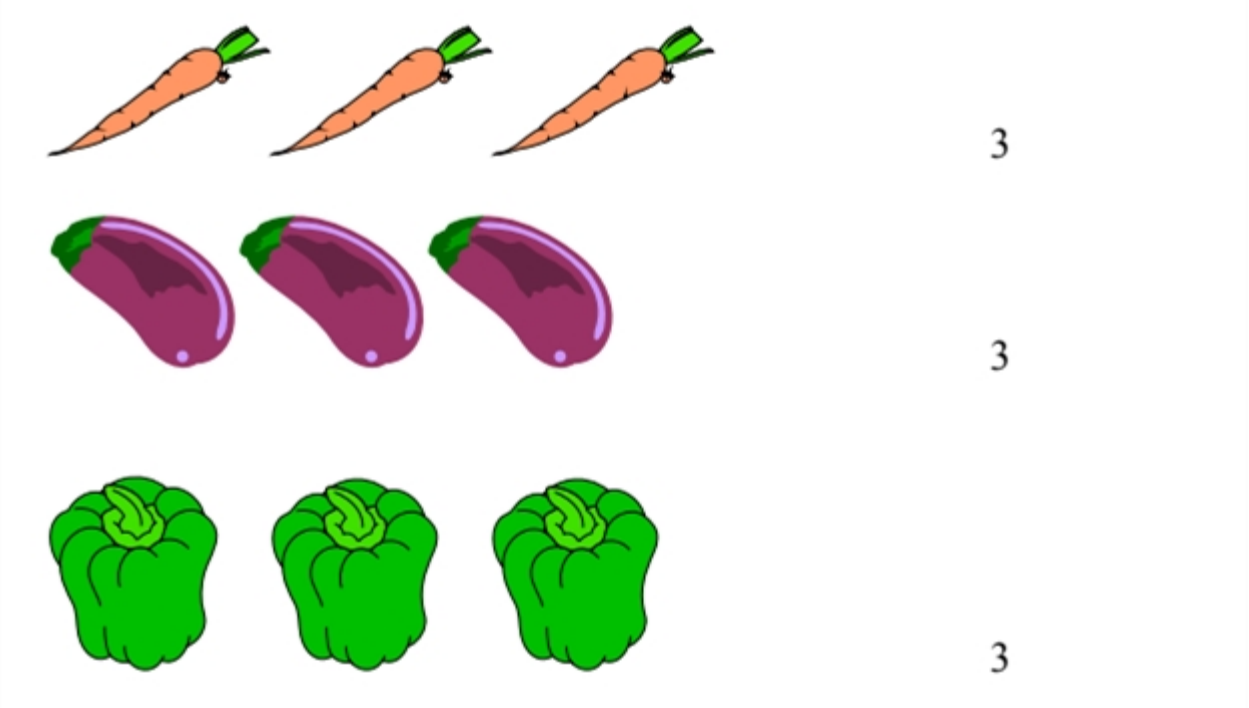
Trace 2 in each cell

2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2

2	2	2	2	2	2	2	2

Concept of three

These are pictures of three vegetables. We write three like this-3.



Trace three in each cell

3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3

3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3

Concept of four

These are pictures of four insects. We write four like this-4.

4

4

4

Trace four in each cell

4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4

4	4	4	4	4	4	4	4

Concept of five

These are pictures of five flowers. We write five like this-5.

5

5

5

Trace five in each cell

5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5

5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5

Exercise 2.1

1. How many doors are there in your classroom?
2. How many fingers do you have in a hand?
3. How many eyes do you have?
4. How many windows are there in your classroom?
5. How many blackboards are there in your classroom?
6. How many fans are there in your classroom?
7. How many lights are there in your classroom?
8. Set aside the following number of sticks:
   2, 4, 5, 1 and 3.
9. The teacher can show different numbers of fingers and ask how many.
10. How many legs does a table have?

Exercise 2.2

Writing of numerals 1 to 5

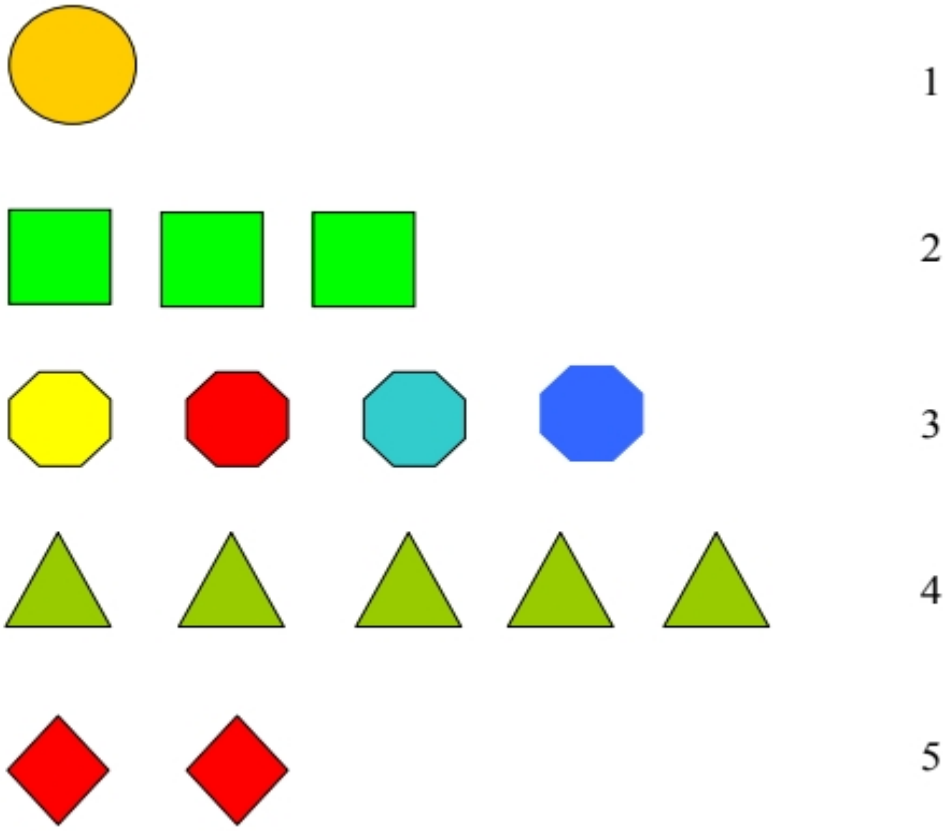
Complete each row by writing the numerals given at the beginning of the row:

1								
1								
2								
2								
3								
3								
4								
4								
5								

5								

Exercise 2.3

Match the number of figures in each collection with the correct number by drawing lines



Exercise 2.4

Write the number of objects in each collection under it.

2.1 Counting

1.Colour or shade in each column as many blocks as the number shown at the bottom of the column.

1	2	3	4	5

2. Fill in blanks:

2 is ___ more than 1.
3 is ___ more than 2.
4 is ___ more than 3.
5 is ___ more than 4.
Thus 1 is the smallest number and 5 is the largest number.

Saying the numbers in order from smallest to largest that is 1, 2, 3, 4, 5 is called **counting.**
Saying the numbers in order from largest to smallest that is 5, 4, 3, 2, 1 is

called **counting back.**

Exercise 2.5

These exercises may be repeated as many times as necessary for mastery of these by all students

1. Count from 1 to 5.
2. Count back from 5 to 1.
3. Read the following numbers:
   1, 4, 5, 3 and 2.
4. Write all the numbers in order from 1 to 5.
5. Write the numbers(dictated by the teacher):
   3, 5, 1, 2 and 4.

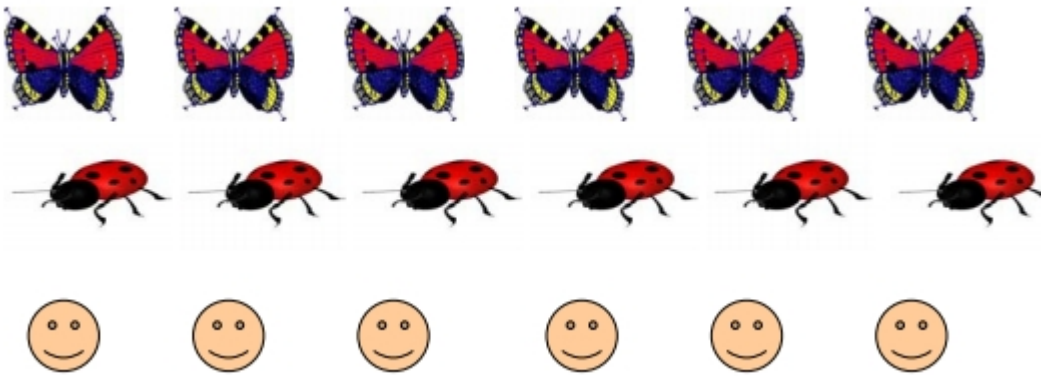
UNIT 3

Concept of Numbers 6 to 9

We need to learn more numbers to describe collections having more than five objects, a different number for each collection as the number of objects increases by one.

Concept of Number Six

Five and one more is six. We write six like this-6
The collections given below have 6 objects:



Show the video: https://youtu.be/pzmB0GoEKkA
(You can begin at 3:42 minutes)
Or the teacher can show how to write these numbers)

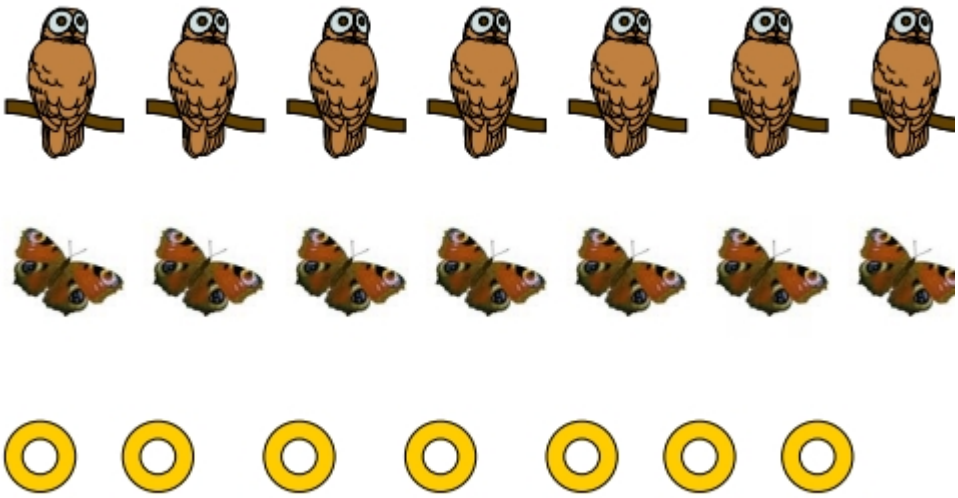
Trace 6 in each cell

6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6

6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6

Concept of Number Seven

Six and one more is seven. We write seven like this-7.
The collections given below have 7 objects:

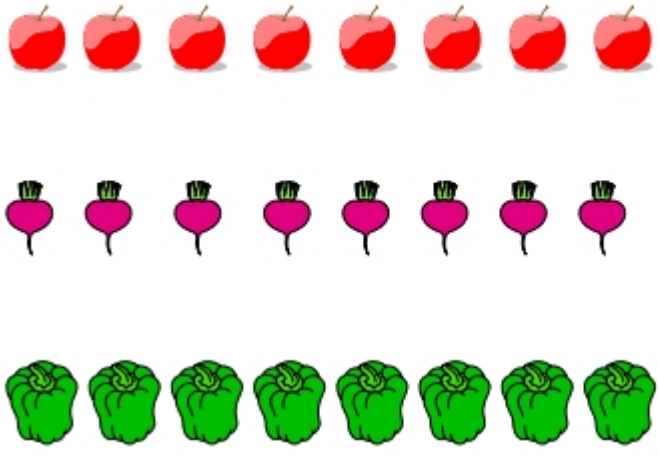


Trace 7 in each cell.

7	7	7	7	7	7	7	7
7	7	7	7	7	7	7	7
7	7	7	7	7	7	7	7
7	7	7	7	7	7	7	7
7	7	7	7	7	7	7	7

Concept of Number Eight

Seven and one more is eight. We write eight like this-8.
The collections given below have 8 objects:

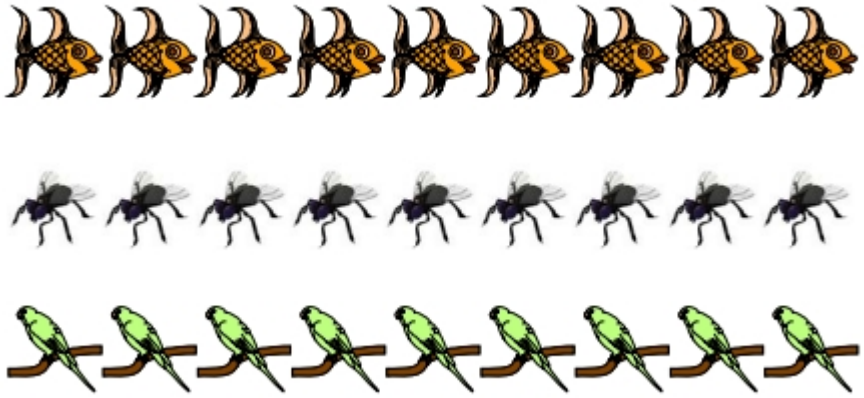


Trace 8 in each cell.

8	8	8	8	8	8	8	8
8	8	8	8	8	8	8	8
8	8	8	8	8	8	8	8
8	8	8	8	8	8	8	8
8	8	8	8	8	8	8	8

Concept of Number Nine

Eight and one more is nine. We write nine like this-9.
The collections given below have 9 objects:



Trace in each cell number 9

9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9

Counting Numbers from 1 to 9

Ask students to shade as many columns as the numbers given in the last row.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

This shows 2 is 1 more than 1.
This shows 3 is 1 more than 2.
This shows 4 is 1 more than 3.
This shows 5 is 1 more than 4.
This shows 6 is 1 more than 5.
This shows 7 is 1 more than 6.
This shows 8 is 1 more than 7.
This show 9 is 1 more than 8.
Count from 1-9.
Provide practice in counting from 1 to 9, until students are fluent in it.
Counting helps us to find the number of objects and set aside a number

of objects.

When the number of objects is large, it may be difficult by just looking at it to find out how many objects are there. We can find the number of objects by pointing to each object a different one as we say each number in counting. The number that we say when we point to the last object gives the number of objects.

Demonstrate it by examples.

Similarly, we can set aside a given number of objects by setting aside one object as we say each number in counting till the given number.

Demonstrate it by examples.

Saying numbers from largest to smallest in order-9, 8, 7, 6, 5, 4, 3, 2, 1 is called **counting back.**

Provide practice in counting back from 9 to 1.

Exercise 3.1

Show the video: https://youtu.be/lAQ2HTqTl2w

1. Count from 1 to 9.

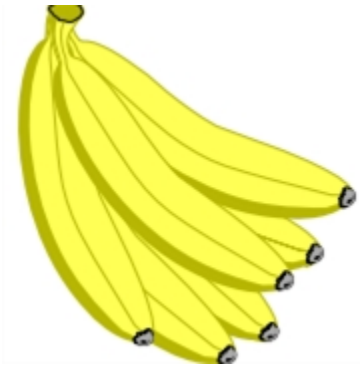
2. Count back from 9 to 1.

3. Set aside the following numbers of sticks: 2, 5, 7, 9, 8, 3, 4, 6 and 1.

4. How many runners are in the race?

_____

5. How many bananas does the bunch given below have?



_____

6. How many petals does the flower given below have?

_____

7. Raise 1-9 fingers and ask students how many fingers are there?

8. Read the following numbers:
   8, 4, 3, 2, 7, 9, 1, 6 and 5.
9. Write missing numbers in counting from 1 to 9.

1		3			6			9

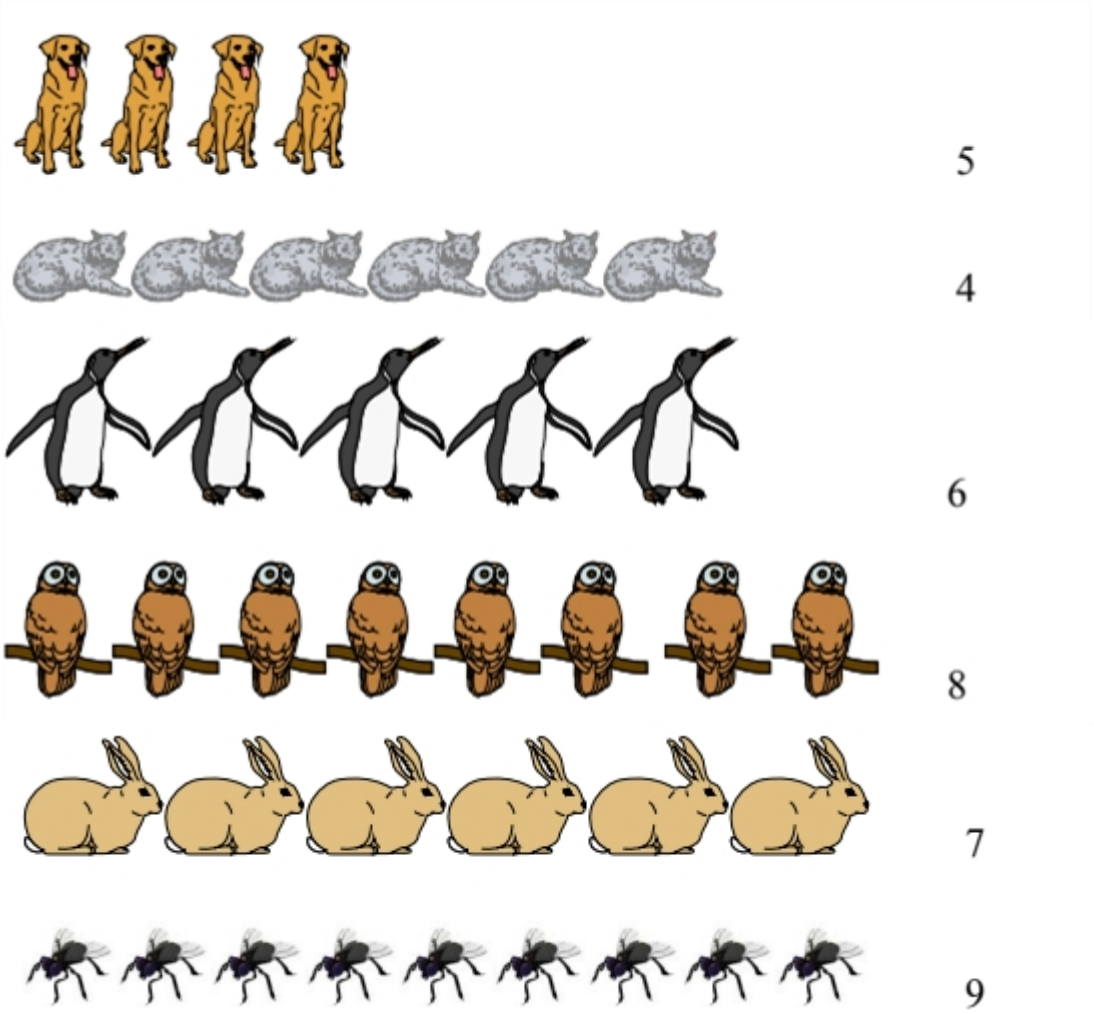
10. Write missing numbers in counting back from 9 to 1.

9		7			4			1

11. Write the following numbers (to be dictated by the teacher).
    6, 8, 3, 9, 1, 4, 2, 5, 7, 9, 4, 6, 8, 3, 7, 2, 1
12. Where do you see numbers in your surroundings

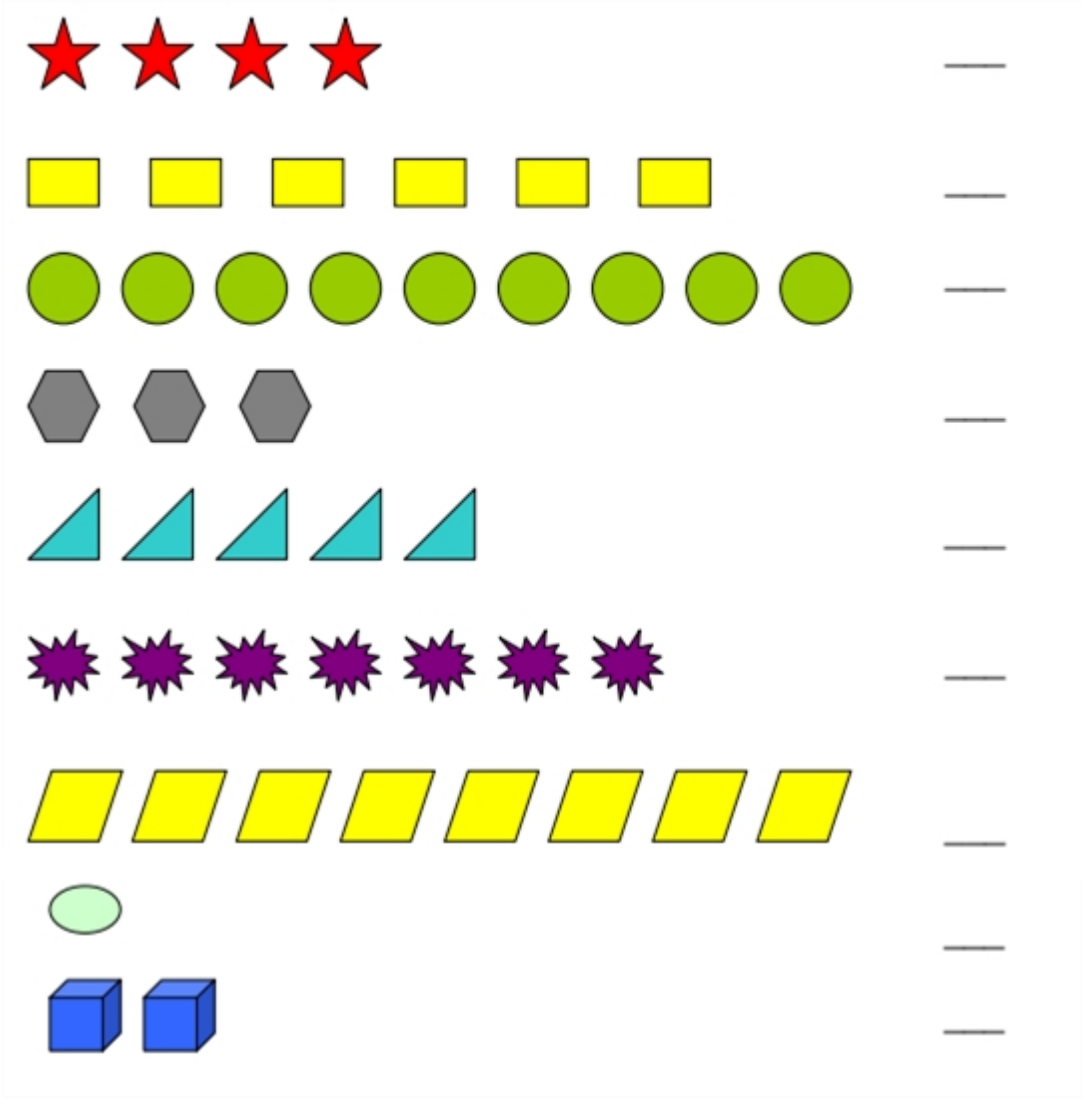
Exercise 3.2

Match the number to the collection having that many objects by joining them with lines:



Exercise 3.3

Write the number of objects in each collection against it:



Exercise 3.4

Write all numbers in counting up to 9 beginning with the given number against it:

4 – 5, 6, 7, 8, 9.

6 -

7 -

8 -

5 -

2 -

1 -

3 -

Exercise 3.5

Write all numbers in counting back beginning with the given number against it:

4 – 3, 2, 1.

2 -

3 -

5 -

6 -

7 -

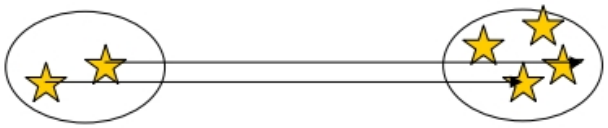
8-

9 -

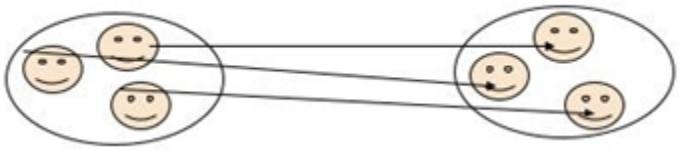
UNIT 4

Comparison of Numbers 1 to 9

Show 2 collections of objects or children in the class and ask how many objects or children each group has, which collection has more objects or children. The numbers that come later in counting are greater than numbers that come before it. For example 5 comes in counting after 2, therefore 5 is greater than 2.
We can compare two collections of objects by matching each object of one collection with one object of the other collection. The collection in which some objects are leftover has more objects.



For example, in the collections given above when we match the objects two objects are left in the collection on the right. Therefore it has more objects.
The number that gives the number of objects in the larger collection is said to be greater than the number that gives the number of objects in the smaller collection. As there are 4 objects in the larger collection and 2 in the smaller collection we say four is **greater than** two.
We write it as $4 > 2$
The number that gives the number of objects in the smaller collection is said to be less than the number that gives the number of objects in the larger collection. As there are 2 objects in the smaller collection and 4 in the larger collection we say two is **less than** four.
We write it as $2 < 4$
Note that the **corner of < or > points to the smaller number.**
If there are no objects left in any collection after matching objects as in the collections given below.



We say both collections have an **equal** number of objects.
We write it as $3 = 3$

Exercise 4.1

Set aside two heaps of the following number of sticks.
Compare the two heaps and tell how many more one heap has than the other.

1 and 3

1 and 2

2 and 2

2 and 4

3 and 3

5 and 3

6 and 3

4 and 7

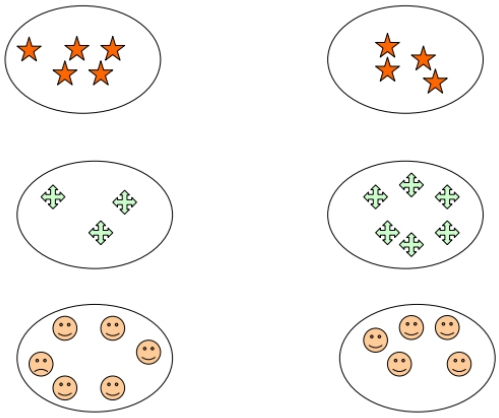
5 and 2

8 and 4

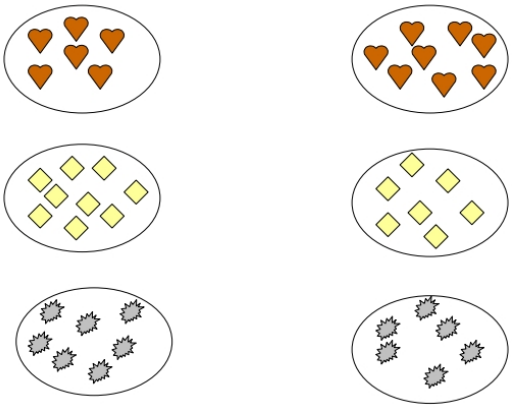
9 and 5

Exercise 4.2

1. Mark a √ under the collection that has more objects.



Mark a √ under the collection that has fewer objects



Exercise 4.3

The teacher may ask questions like the ones given below:

1. Are there more windows or doors in the classroom?
2. Are there fewer desks or chairs in the classroom?
3. Are there as many chairs as children in the classroom?
4. There are 6 sparrows and 7 crows sitting on a tree. Are there more sparrows or crows?
5. Arun has 5 rupees and Hina has 2 rupees. Who has more money?
6. Arti has 5 dolls and Rani has 8 dolls. Who has fewer dolls?

UNIT 5

Concept of Addition

Addition of two numbers whose sum does not exceed 9

The teacher can set aside three sticks and two sticks in two separate heaps and combine the two and ask how many sticks does the combined heap have?
The teacher can set aside three sticks and add two more sticks to the heap and ask how many sticks do we have now?
Ask three children to come in front and then two more to come and join them. How many children are there now?
We express these in symbols as 3 + 2 = 5.
We call it an **addition equation**.
This is read as three **plus** two is equal to five.
We also say the **sum** of 3 and 2 is five.
We can find the sum of any two numbers by setting aside as many sticks as the numbers and combining and counting the sticks to find their sum.

Example

If you combine two heaps of 4 sticks and 3 sticks, you will have a heap of 7 sticks.

We read it as four plus three is equal to 7.

Exercise 5.1

For each question given below
(a) Set aside two heaps of sticks with the numbers of sticks given below.
(b) Combine the two heaps and find the number of ticks in the combined heap.
(c) Write the addition equation after the arrow.
(d) Read the addition equation.

1. 1 and 2 → 1 + 2 = 3

2. 3 and 2 →

3. 2 and 2 →

4. 1 and 3 →

5. 3 and 5 →

6. 4 and 5 →

7. 3 and 4 →

8. 2 and 5 →

9. 7 and 2 →

10. 1 and 8 →

Exercise 5.2

Ask students

(a) Set aside the number of sticks given below on the left.
(b) Add the number of sticks given on the right
(c) Find the number of sticks that they will now have.
(d) Write the addition equation.
(e) Read the addition equation.

1. 4 and 5 → 4 + 5 = 9

2. 2 and 1 →

3. 4 and 1 →

4. 2 and 2 →

5. 3 and 3 →

6. 4 and 2 →

7. 5 and 2 →

8. 4 and 3 →

9. 7 and 2 →

10. 6 and 3 →

Exercise 5.3

Write the sum of the following numbers. You may use sticks or draw lines.

1. 1 + 2 = 3

2. 2 + 4 =

3. 2 + 2 =

4. 4 + 4 =

5. 5 + 3 =

6. 5 + 4 =

7. 6 + 2 =

8. 7 + 2 =

9. 8 + 1 =

10. 3 + 3 =

11. 3 + 2 =

12. 6 + 3 =

13. 3 + 4 =

14. 5 + 2 =

15. 7 + 1 =

Exercise 5.4

Teachers can read the questions given below and ask students to write the addition equation for the solution.

1. You had 1 toffee your sister gave you 1 more toffee. How many toffees do you have now?

2. A baby takes 3 steps and then 2 more. How many steps did he take in all?

3. Mohit ate 1 apple and 2 bananas. How many fruits did he eat?

4. Arjun had 4 toys and he bought 3 more. How many toys does he have now?

5. There were 5 birds sitting on a tree and 3 more came and joined them. How many birds are on the tree now?

6. There were 3 girls and 2 boys in a group dance. How many children are in the group dance?

7. Rita bought 6 coloured and 2 black pencils. How many pencils did she buy?

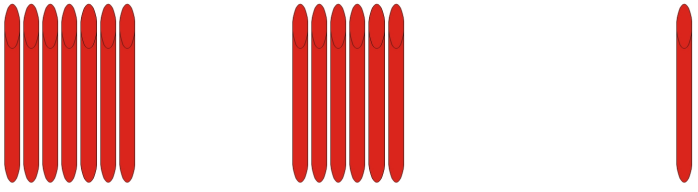
8. Ajay is 2 years older than his brother. If his brother is 7 year old. How old is Ajay?

Exercise 5.5

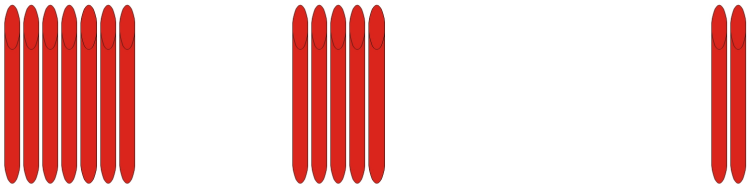
Show the video: https://youtu.be/nIUvxPKzgwU

Divide the following number of sticks in two collections in as many ways as you can and write the corresponding addition facts:

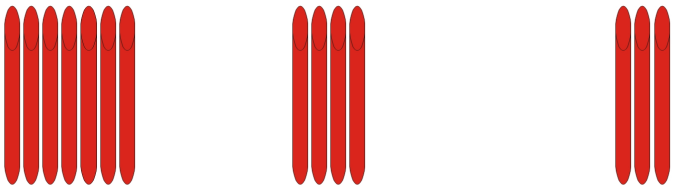
Seven sticks can be divided into two collections in following manner, which show



7 = 6 + 1



7 = 5 + 2



7 = 4 + 3

Activity

Divide the following number of sticks in two collections in as many ways as you can and write the corresponding addition facts:

3

4

6

8

9

UNIT 6

Concept of Subtraction

Teacher may demonstrate the following as models for subtraction:

1. Set aside a certain number of sticks say 5 and take away a smaller number of sticks from these say 3 and ask how many are left?
2. Set aside 5 sticks and 3 sticks in two separate heaps and match sticks in the two heaps and ask how many sticks are left over in the heap with 5 sticks. Thus the heap with 5 sticks has 2 more than the other heap.
3. Draw 5 lines and strike off 3 of these lines and ask how many are left? |||𝍸
4. Match objects in the two collections of objects given below by drawing lines, and ask how many objects are left in the larger collection?

5. If there are 5 birds sitting on a tree and 3 fly away how many birds are still on the tree?

We can represent all of these by a **subtraction equation**
5 – 3 = 2.
We read this as five **minus** three is equal to two.
We can also say five is 2 **more than** 3 or the **difference** between 5 and 3 is 2.

Exercise 6.1

Activities with sticks

1. Ask children to set aside a certain number (1-9) of sticks and then remove a number of sticks less than or equal to the number set aside and tell how many sticks are left.
   Provide practice using different sets of numbers.
2. Ask children to set aside two heaps of a certain number of sticks and ask which heap has more? How many more? Which heap has less? How many less?
   Provide practice using different sets of numbers.
3. If one heap has 4 sticks, make another heap that has 3 more sticks.
4. If one heap has 5 sticks, make another heap that has 2 sticks less than this?
5. Repeat 3 and 4 using different numbers.

Exercise 6.2

How many animals are left after some of these given on the left fly or go away.

2 - 1 =

3 - 1 =

3 - 2 =

4 - 2 =

5 - 2 =

7 - 3 =

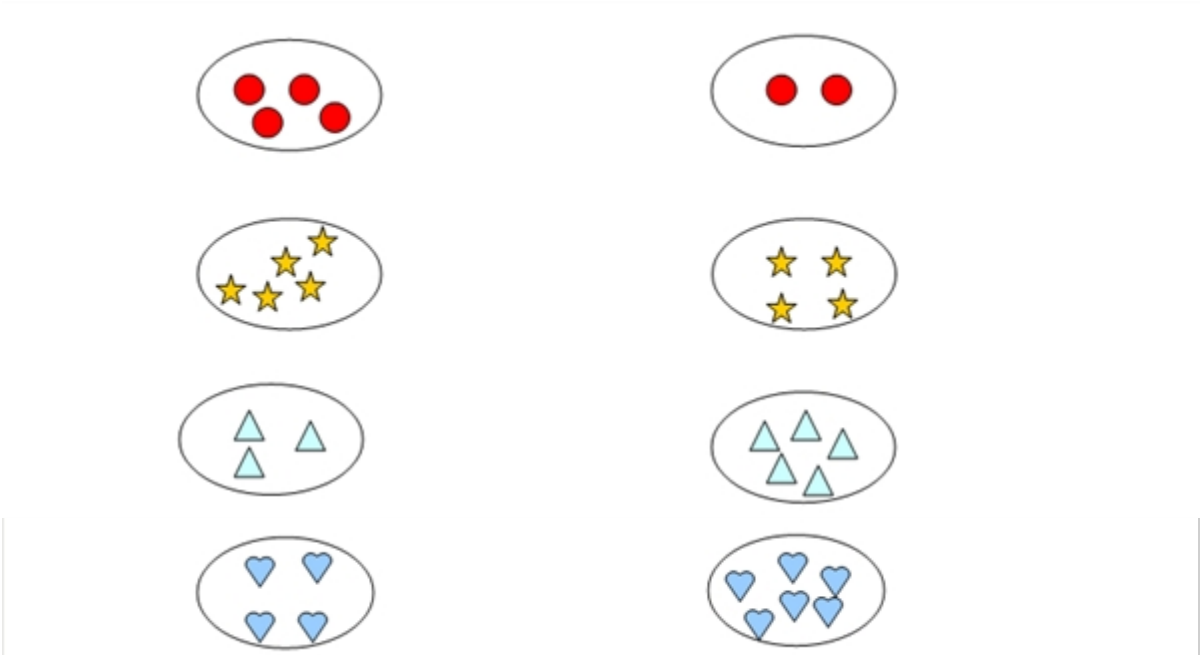
Exercise 6.3

Fill in the blank entries in the table

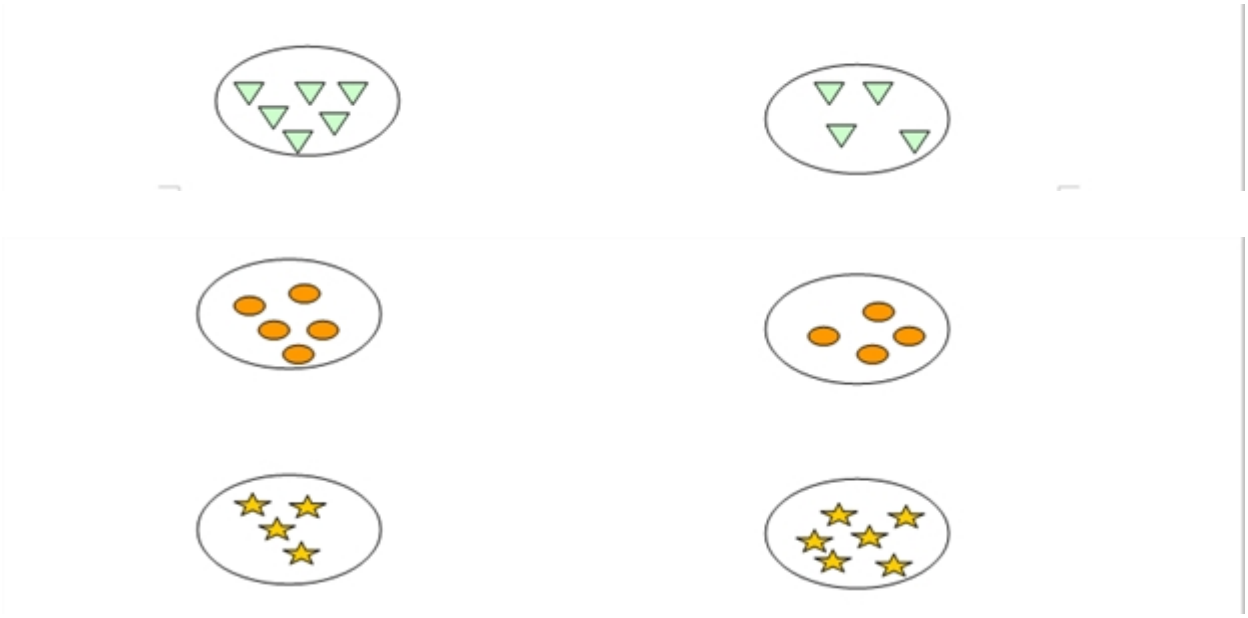
Lines	Write the number of lines	Strike off the number of lines given below	Write the number of remaining lines
|||		1	
||||		1	
||||		2	
|||||		1	
|||||		3	
|||||		2	
||||||		3	
||||||||		5	
||||||		4	
|||||||		6	
|||||		3	
||||||		4	
||||||		5	
|||||||		2	

Exercise 6.4

A number of two collections of objects are given below. Compare the two collections and mark a √ under the collection that has more objects. Write how many more objects the bigger collection has.



A number of two collections of objects are given below. Compare the two collections and mark a √ under the collection that has fewer objects. Write how many fewer objects the smaller collection has.



Exercise 6.5

Subtract. (You may use sticks, fingers or lines).

1. 7 - 5 = 2

2. 3 - 2 =

3. 4 - 1 =

4. 8 - 5 =

5. 5 - 3 =

6. 4 - 2 =

7. 5 - 2 =

8. 6 - 2 =

9. 9 - 5 =

10. 7 - 4 =

11. 8 - 6 =

Exercise 6.6

The teacher may read these questions and ask students to write and read the subtraction equation:

1. Rita had four sweets she gave two to her brother. How many sweets does she have now?

2. Abhay bought 3 balloons and one burst. How many balloons does he have now?

3. Runa had 4 rupees her mother gave her 5 rupees. How many rupees does she have now?

4. Gaurav has 2 rupees and he wants to buy a chocolate costing 5 rupees. How many more rupees does he need?

5. Sunita has 4 dolls and Sushma has 2 dolls. Who has more dolls and how many more?

6. Sanjay wants to collect 6 caps of Campa cola to buy a gift. He has already collected 5 caps. How many more does he need?

7. Ram has 7 toys and sham has 4 toys. Who has more toys and how many more?

8. There were 8 children in a group dance. If there were 4 girls in the dance. How many boys were there?

UNIT 7

Concept of Time

Day and night

Watch the video: https://youtu.be/gNDUPDtrkjQ

The teacher can ask students if it is now daytime or night time?

Day time is when the sun rises and there is light.

Night time is when the sun sets and it is dark.

Earlier and Later

The activity we do before an activity is called **earlier**.

The activity we do after an activity is called **later**.

The teacher can ask students to name the activities in order they do before coming to school. Then tell them which activity came earlier than another activity, and which came later than another activity.

Units of Time

Watch the video: https://youtu.be/HqkXUJ7RHEg

(Show this video upto 4:23 minutes)

The teacher can ask students to give some activities that take a long/little time. We measure time in **days, hours, minutes and seconds.**

Second is the shortest unit of time.

Some of the activities that take about 1 second are clapping your hands, blinking eyes, saying one number.

1 minute = 60 seconds.

Some of the activities that take about 1 minute are counting from 1 to 60, saying a nursery rhyme of about 4 lines, brushing your teeth.

1 hour = 60 minutes.

Some of the activities that take about 1 hour are 2 TV shows.

1 day = 24 hours. A day is from midnight to the next midnight.

Exercise 7

1. Name some activities you do in
   (a) daytime.
   (b) nighttime.

2. Name some activities that take a
   (a) short time.
   (b) long time.
3. Select the activity that comes earlier by encircling the letter before it.
   A. Eating breakfast.
   B. Going to school.
4. Select the activity that comes later by encircling the letter before it.
   A. Recess
   B. Mathematics class
5. Name activities you do for brushing your teeth in order.
6. Name activities in order that you do after going back home from school.
7. Would it take a few hours or minutes to see a movie?
8. Would it take a few minutes or seconds to brush your teeth?
9. What is the shortest unit of time?
10. What is the longest unit of time?
11. Name some activities that take a few
    (a) seconds.
    (b) minutes.
    (c) hours.

8. Fill in the blanks:
   (a) 1 day = _____ hours.
   (b) 1 hour = _____minutes.
   (c) 1 minute = _____seconds.

UNIT 8

Concept of zero and numbers ten to twenty

Concept of zero as absence of objects

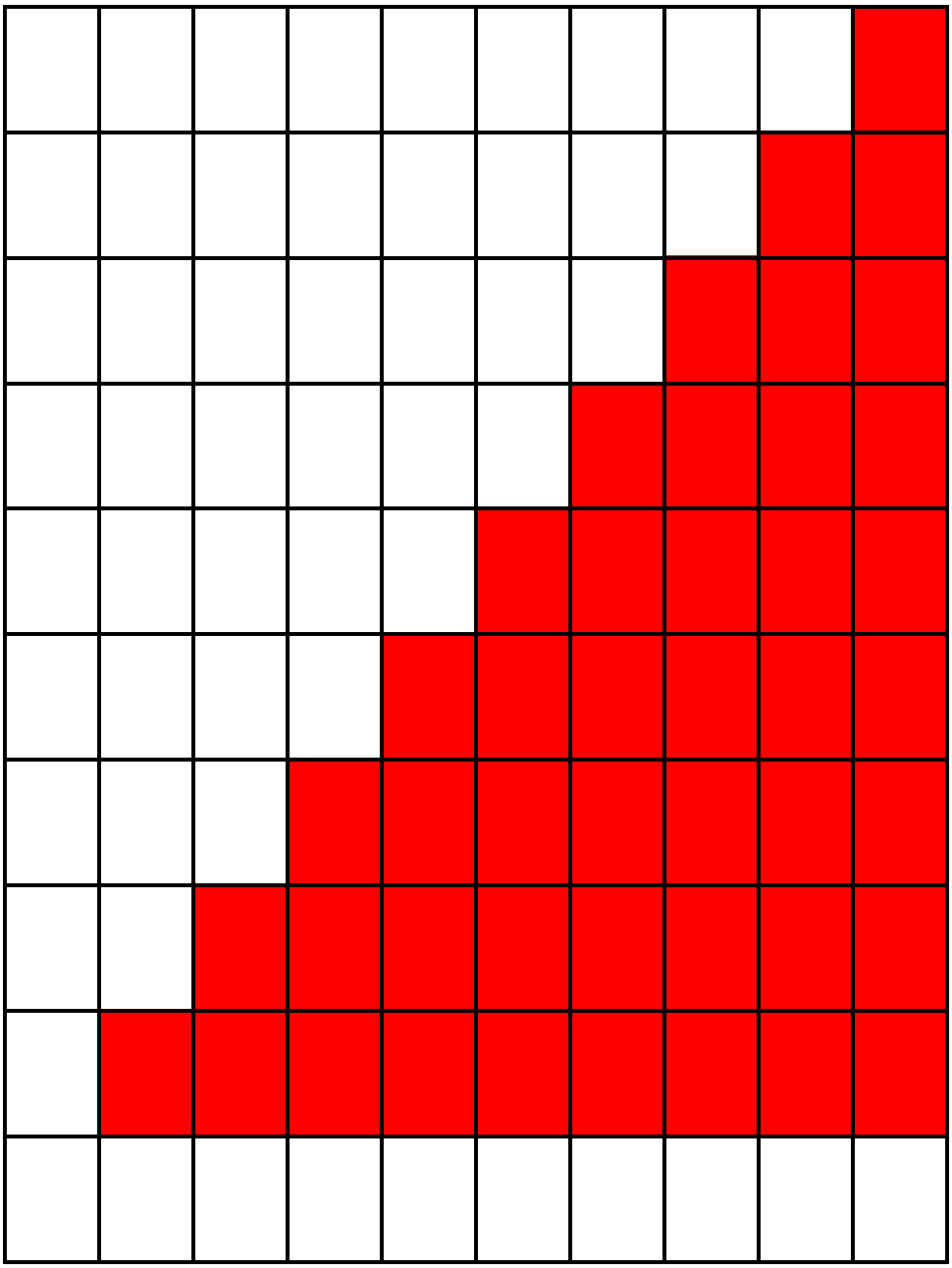
Hold some sticks in your left hand and no sticks in your right hand and ask children how many sticks do I have in each hand? They will say no sticks.
If we have no sticks in our right hand we say we have **zero** sticks in our right hand.
Draw 3 lines, and ask how many lines are there? Then erase 1 and ask how many lines are left. Erase 1 more and ask how many lines are left. Erase that too and ask how many lines are left.
If no sticks or objects are left, we say **zero** objects or lines are left.
We write zero like this-0

Trace 0 in each cell.

0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Concept of numbers ten to twenty

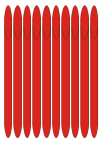
In the table given below, write the number of squares shaded in each column.



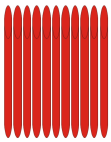
What does this show?
1 is one more than __
2 is one more than __
3 is one more than __

4 is one more than __
5 is one more than __
6 is one more than __
7 is one more than __
8 is one more than __
9 is one more than __

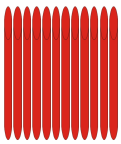
Note each number is one more than the number before it. As many collections will have more than 9 objects. We need more numerals to be able to tell the number of objects in them. We need to have numerals for each collection as the number of objects increases by one. The numerals in order as the number of objects increases by one are as follows:



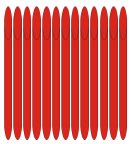
9 and 1 more is **ten**-10



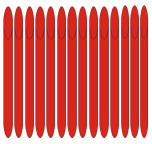
10 and 1 more is **eleven-**11



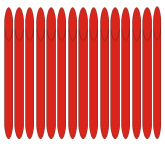
11 and 1 more is **twelve-**12



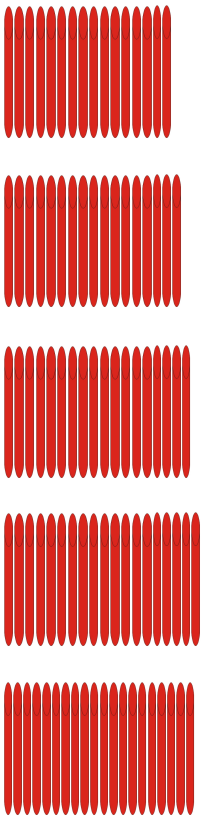
12 and one more is **thirteen**-13.



13 and 1 more is **fourteen**-14



14 and 1 more is **fifteen** -15.



15 and one more is **sixteen** -16.

16 and one more is **seventeen** -17

17 and 1more is **eighteen**-18

18 and 1 more is **nineteen**-19.

19 and 1 more is **twenty**- 20

Exercise 8.1

1. Count from 1 to 20.

2. Count back from 20 to 1.

3. Write numbers from 1 to 20.

1									10
11									20

4. Set aside number of sticks given below

   7, 10, 12, 9, 15, 17, 20, 14, 16, 18, 13, 14, 18, 8, 19, 11, 2 2.

5. Draw as many lines as the number against it.

10	
15	
13	
12	
11	
16	

19	
14	
18	
20	

6. Read the following numbers:
   3, 7, 9, 2, 8, 1, 10, 13, 17, 15, 18, 19, 11, 14, 12, 16, 0

7. Write the following numbers (to be dictated by the teacher):
   6, 8, 9, 7, 4, 1, 0, 10, 2, 5, 3, 15, 11, 12, 13, 18, 14, 20, 19, 16, 17.

Exercise 8.2

Match the numbers on the right with dots on the left by drawing lines between them:

• • • • • • • • • • •	11
• • • • • • • • • • • •	13
• • • • • • • • • • • • •	15
• • • • • • • • • • • • • •	18
• • • • • • • • • • • • • • •	12
• • • • • • • • • • • • • • • •	19
• • • • • • • • • • • • • • • • •	16
• • • • • • • • • • • • • • • • • •	11
• • • • • • • • • • • • • • • • • • • •	14

• • • • • • • • • • • • • • • • • •	20

Exercise 8.3

Write numbers that come just after the following numbers

9	10
17	
12	
15	
19	
0	
11	
14	

18	
13	

Write numbers that come just before the following numbers

9	10
	15
	19
	17
	12
	14
	16
	18

	11
	20

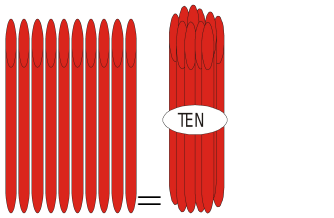
Write numbers that come between the following numbers

17	18	19
15		17
10		12
13		15
18		20
14		16
11		13
12		14
0		2
16		18

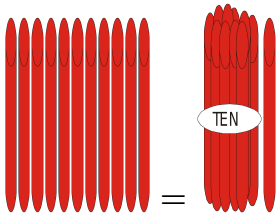
UNIT 9

Concept of Place Value

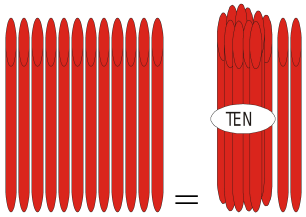
As the number of objects increases, it becomes cumbersome to count and compare them. If we group objects, it becomes easier. The number system we use is based on ten.
If the number of sticks is greater than ten, we can group ten sticks in a bundle by a rubber band and call it a bundle of ten-sticks.
We would then have a bundle of 10 sticks and a number of loose sticks to represent numbers 10 to 19. For 20 sticks as we would have 10 loose sticks, we can make another bundle of 10 sticks, Thus we will have 2 bundles of 10 sticks. We can represent numbers 10-20 as follows:



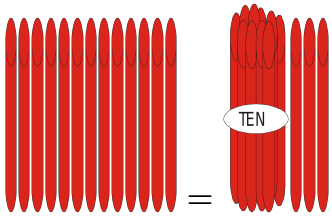
10



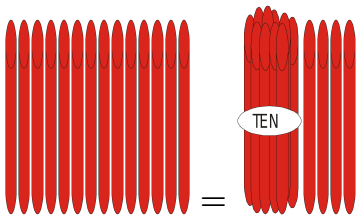
10 +1= 11



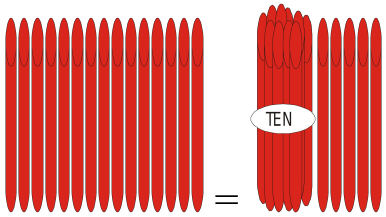
10 + 2 = 12



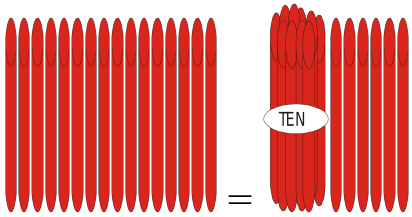
10 + 3 = 13



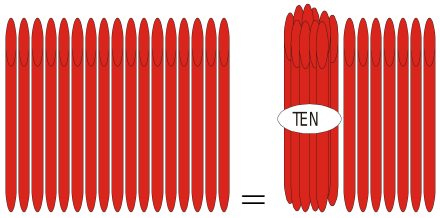
10 + 4 =14



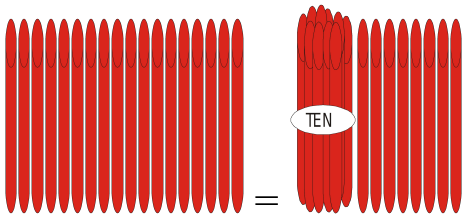
10 +5 = 15



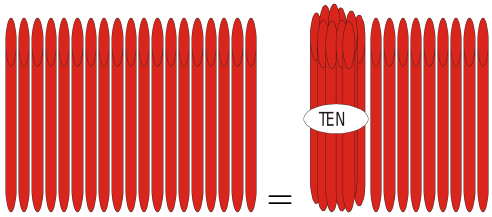
10 + 6 =16



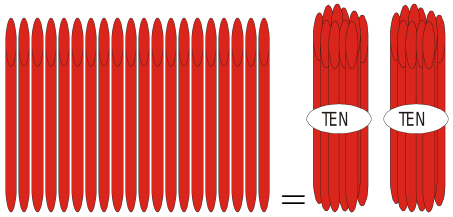
10 + 7 = 17



10 + 8 = 18



10 + 9 =19



10 + 10 =20

The objects can thus be counted by forming groups of ten. For example, for counting more than ten sticks, first form bundles of ten sticks by using rubber bands and count the number of single sticks. If three sticks are left over after forming a bundle of ten then the number of sticks is thirteen as three more than ten is thirteen. Similarly, other collections of 11 to 19 sticks can be counted.
The pictures of objects can be counted in the same manner by enclosing ten objects in a closed curve.
Also note that the method of writing numbers is based on grouping by ten, the numeral on the left represents the numbers of tens and the numeral on the right the number of ones.
This enables us to write all numbers by learning to write ten numbers-0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 only.
The numbers-0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are called **digits**.

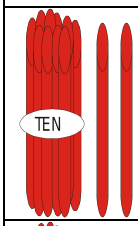
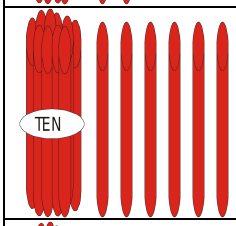
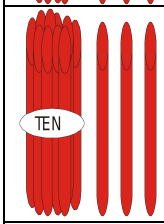
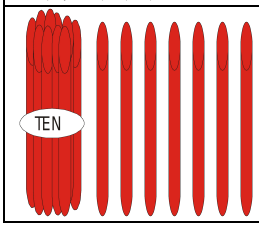
Concept of zero as a placeholder

Note if we have ten sticks and a bundle of 10 sticks is made, we have one bundle of ten sticks and 0 single sticks. One and zero in 10 denotes one bundle of ten sticks and zero loose sticks. Similarly if we have twenty sticks and bundles of ten sticks are made we have two bundles of ten sticks and no sticks are left over. Two and zero in 20 denote two bundles of ten-sticks and zero loose sticks. Zero here is used as a placeholder so that 1 in 10 or 2 in 20 denote tens.

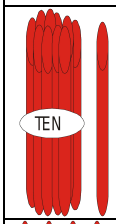
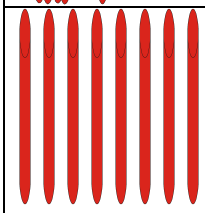
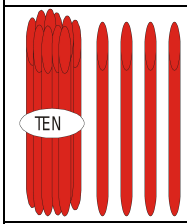
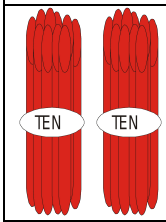
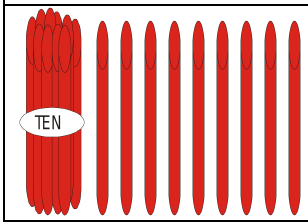
Exercise 9.1

1. Show the following numbers of sticks using single sticks and bundles of 10 sticks if the number is greater than 9
   5, 8, 4, 9, 7, 3, 15, 13, 17, 11, 10, 14, 18, 12, 20, 19, 16

2. A number of group of ten objects and single objects are given below, write the number of tens and ones and total number of objects:

Sticks	Tens	Ones	Number of sticks
	1	2	12
			
			
			

Sticks	Tens	Ones	Number of sticks

Comparison of two collections

We can compare two collections of objects by matching.
A collection in which some objects are left has more objects and the other fewer.
If all objects are matched then one collection has as many objects as the other.
If we have two collections of pictures we can match them by drawing lines matching each object of one collection with one and a different object of the other collection.
Ask children to compare two collections of objects such as blocks, sticks, chips by asking questions such as:

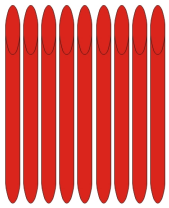
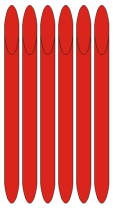
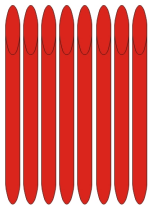
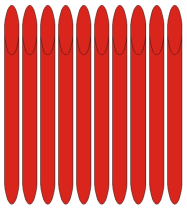
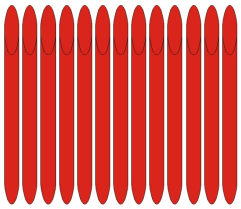
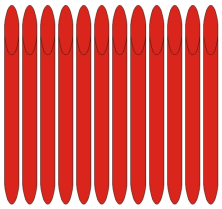
Tell which of the two collections has more objects?
Tell which of the two collections has fewer objects?
Set aside as many objects as sticks as in a given collection.
Ask questions requiring comparison of objects in their surroundings such as
Are there as many children as chairs in the classroom?
Are there fewer doors or windows in the classroom?
Are there more doors or windows in the classroom?

Comparing collections in which items are grouped by ten

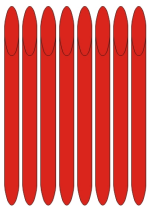
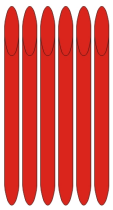
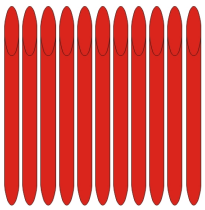
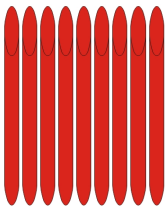
Grouping by ten also makes comparison of collections that have 10 to 20 objects easy. If both collections have one ten bundle comparison of only the loose sticks tells which collection has more objects. If one collection has one bundle of ten sticks and the other has only loose sticks up to 9, then that collection with a ten bundle has a greater number of sticks than the other collection.
Give examples.

Exercise 9.2

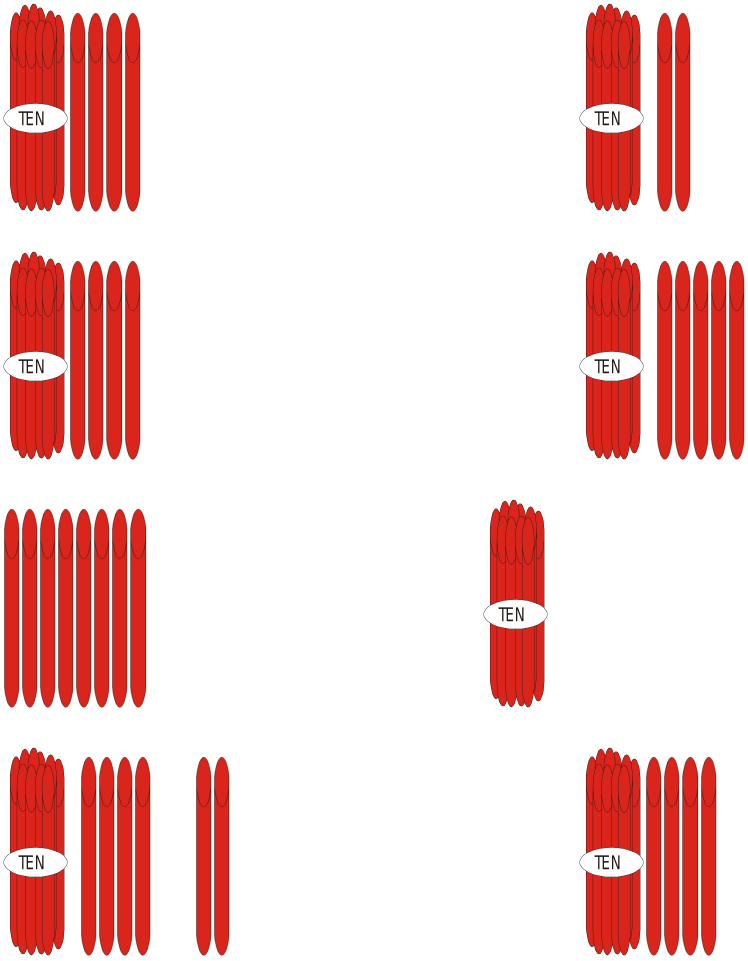
1. Mark a √ under the collection that has more objects

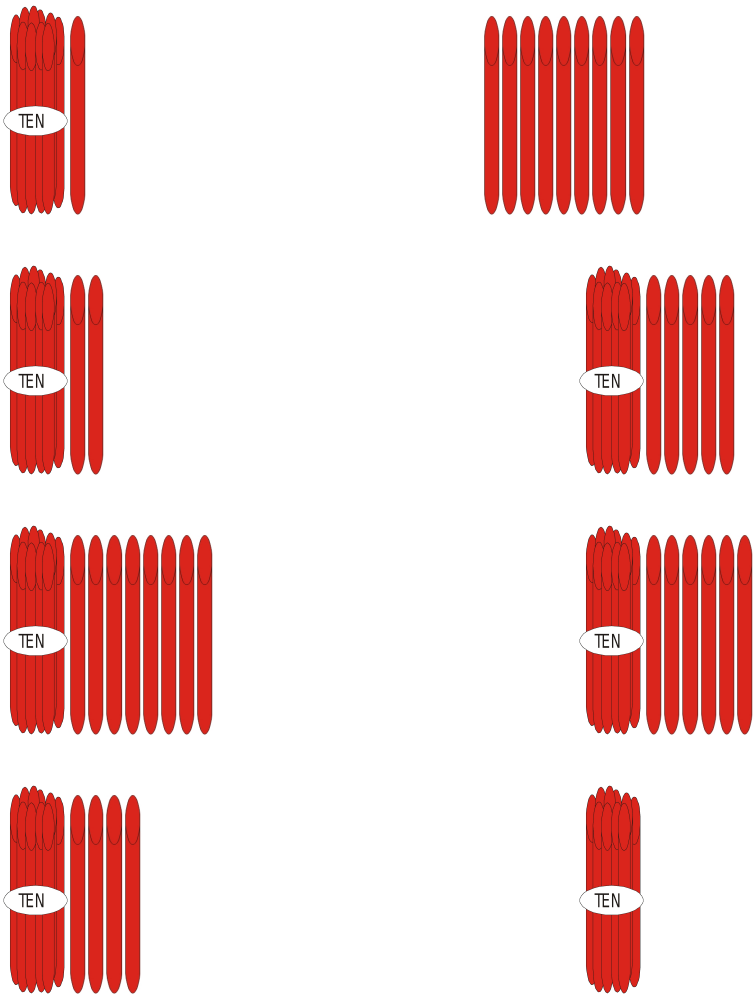
2. Mark a √ under the collection that has fewer objects

3. Mark a √ under the collection that has more objects



4. Mark a √ under the collection that has fewer objects


TEN
TEN
TEN
TEN
TEN
TEN

UNIT 10

Geometry

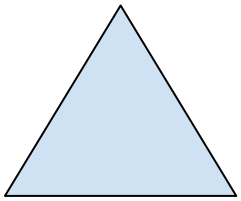
Show the video: https://www.youtube.com/watch?v=svrkthG2950&t=95s

2-D Shapes

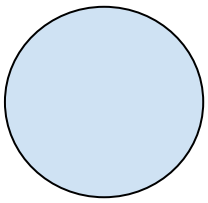
Show examples of squares, rectangles, triangles, circles, hexagons, parallelograms, and trapeziums/trapezoids in different sizes using models of shapes.
The figures for a square, rectangle, triangle and a circle are given below.

Square

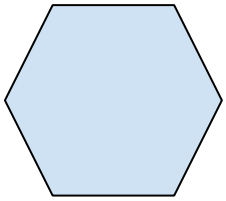
Rectangle



Triangle



Circle



Hexagon

Parallelogram

Trapezium or Trapezoid

3-D Shapes

Show the videos:
https://youtu.be/zPZegz690Mg
https://youtu.be/YxoLlSTu1jo
Show examples of cubes, cuboids also called rectangular prisms, cylinders, cones, pyramids, and spheres in different sizes using models of 3-D shapes and some objects having these shapes.
The figures for a cube, cuboid, cylinder, cone, pyramid, and sphere are given below:

Cube

Cuboid

Cylinder

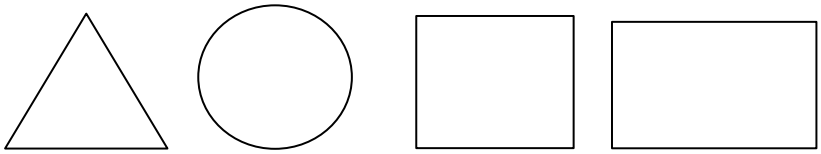
Cone

Pyramid

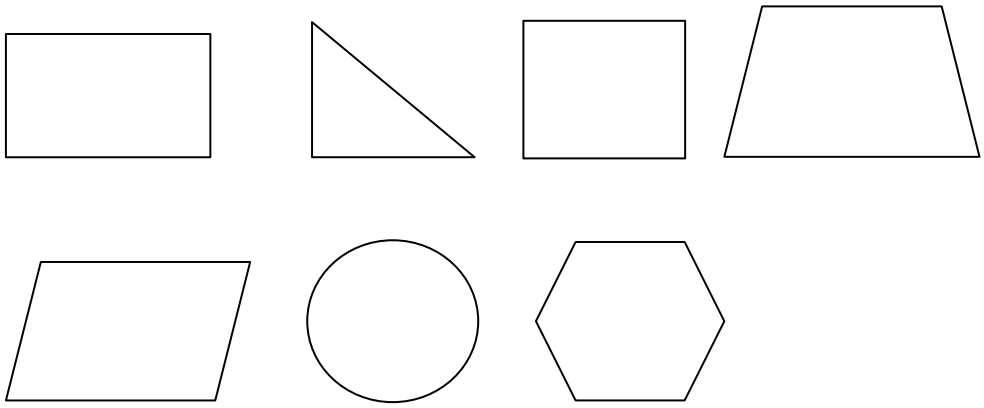
Sphere

Exercise 10

1. Name the shapes given below:



2. Make the following shapes on a Geoboard or Dot paper given in Activity sheet 10.
   (a) A square
   (b) A triangle
   (c) A rectangle
   (d) A parallelogram
   (e) A trapezium
   (f) A hexagon
3. Colour the circles green, square red, rectangles yellow, and triangles blue, parallelogram purple, trapezium black, and hexagon pink.

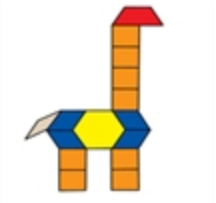


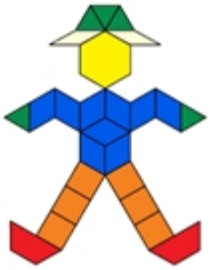
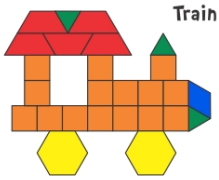
4. Draw a circle with the help of a coin, bangle, or any other circular object.
5. Make the following using toothpicks or matchsticks:
   (a) A square
   (b) A rectangle
   (c) A triangle
   (d) A parallelogram
   (e) A trapezium
6. Trace around the pattern blocks to make the following shapes:
   (a) A square
   (b) A rectangle
   (c) A triangle
   (d) A parallelogram
   (e) A trapezium

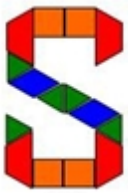
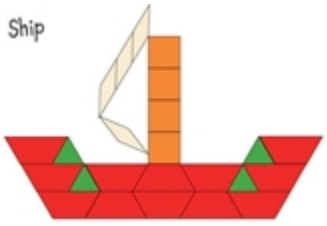
(f) A hexagon

7. Name objects which have the same shape as a
   (a) square
   (b) rectangle
   (c) circle
   (d) triangle
   (e) hexagon

8. If students have pattern blocks, they can get creative and make figures of letter, animals, vehicles etc.



9. Name objects which have the same shape as a
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.

10. Which of the following can roll? Place a ✔ against them.
   (a) cube.
   (b) cuboid.
   (c) cylinder.
   (d) cone.
   (e) pyramid
   (f) sphere.

11. Which of the following can slide? Place a ✔ against them.
   (a) cube.
   (b) cuboid.
   (c) cylinder.

(d) cone.
(e) pyramid
(f) sphere.

12. Name the following 3-D shapes:

UNIT 11

Addition Facts

The addition of two one-digit numbers is called an **addition fact**.
These are very important for further learning. Students should acquire the automaticity of these.

Methods for the addition of two one-digit numbers

We can add two numbers, say 5 and 3 by any of the following methods.

1. Set aside 5 sticks and 3 sticks in two separate heaps then combine the

two heaps and count all the sticks. As the count is 8. Therefore 5 + 3 = 8.

2. Set aside 5 sticks and then add 3 more sticks and count all the sticks. As the count is 8. Therefore 5 + 3 = 8.
3. Count forward 3 numbers beginning with 6-6,7,8. The last number gives the sum. As the last number is 8, 5 + 3 = 8.

Properties of addition

These properties of addition will reduce the number of number facts to be memorised.

1. Add the following numbers:

5 + 1 = 6	1 + 5 = 6
3 + 4 = ___	4 + 3 = ___
2 + 6 = ___	6 + 2 = ___
1 + 2 = ___	2 + 1 = ___
2 + 3 = ___	3 + 2 = ___
3 + 5 = ___	5 + 3 = ___
6 + 4 = ___	4 + 6 = ___
8 + 1 = ___	1 + 8 = ___
6 + 3 = ___	3 + 6 = ___
8 + 4 = ___	4 + 8 = ___

What do you notice?
The order of numbers does not matter in addition.
Thus we can count forward from a larger number as many numbers in order as the smaller number. The last number gives the sum. For example, to add 2 and 6, instead of counting 6 numbers from 2 - 3, 4, 5, 6, 7, and 8 we can count 2 numbers from 6- 7 and 8. As the last number is 8 in both cases, therefore 2 + 6 = 6 + 2 = 8.

2. Add the following numbers:

1 + 0 = 1

2 + 0 = ____.

3 + 0 = ____.

4 + 0 = ____.

5 + 0 = ____.

6 + 0 = ____.

7 + 0 = ____.

8 + 0 = ____.

9 + 0 = ____.

What did you notice?

Any number + 0 = the number.

3. Add the following numbers:

1 + 1 = 2

2 + 1 =

3 + 1 =

4 + 1 =

5 + 1 =

6 + 1 =

7 + 1 =

8 + 1 =

What do you notice?

Any number + 1 = the number that comes just after the number.

Exercise 11.1

1. Find

   $4 + 0 =$

   $3 + 0 =$

   $5 + 0 =$

   $8 + 0 =$

   $0 + 0 =$

2. Find

   $4 + 1 =$

   $9 + 1 =$

   $8 + 1 =$

   $7 + 1 =$

   $1 + 1 =$

3. Given the number facts on the left, find those on the right mentally:

$2 + 3 = 5$	$3 + 2 =$
$4 + 5 = 9$	$5 + 4 =$
$7 + 8 = 15$	$8 + 7 =$
$6 + 5 = 11$	$5 + 6 =$
$1 + 8 = 9$	$8 + 1 =$

Exercise 11.2

Add (You may use sticks or lines.)

5 +2 ------ ------	3 +4 ------ ------	2 +5 ------ ------
6 +2 ------ ------	2 +1 ------ ------	7 +3 ------ ------
5 +1 ------ ------	9 +2 ------ ------	3 +6 ------ ------
4 +3 ------ 7 ------	5 +2 ------ ------	5 +6 ------ ------
5 +1 ------ ------	8 +1 ------ ------	9 +4 ------ ------
2 +1 ------ ------	7 +2 ------ ------	5 +8 ------ ------

3 +7 ------ ------ 4 +6 ------ ------ 8 +4 ------ ------ 8 +3 ------	6 +5 ------ ------ 9 +6 ------ ------ 8 +9 ------ ------ 5 +9 ------	5 +7 ------ ------ 8 +5 ------ ------ 8 +8 ------ ------ 5 +3 ------

2 + 4 ----- ----- 6 +6 ----- -----	3 +3 ----- ----- 9 +3 ----- -----	7 +8 ----- ----- 4 + 4 ----- -----

7	9	2
+9	+9	+3
-----	-----	-----
-----	-----	-----
7	6	8
+7	+8	+2
-----	-----	-----
-----	-----	-----
2	7	4
+2	+4	+5
-----	-----	-----
6	5	7
+7	+5	+7
-----	-----	-----
-----	-----	-----

Exercise 11.3

Solve word problems orally and tell how you got the answer.

1. Rani had 5 rupees, her mother gave her 5 Rupees more. How many Rupees does she have now?

2. Anuj had 4 toys, he got 9 toys on his birthday. How many toys does he have now?

3. Sunita is 6 years older than his brother. If her brother is 5 years old, what is Sunita's age?

4. Gaurav bought a book costing 8 rupees and a notebook costing 3 rupees. How much did he spend in all?

5. Sadhna climbed 9 steps and then 4 more steps after a turn. How many steps did she climb in all?

6. Rahul's mother bought 6 bananas and 4 apples. How many fruits did she buy?

7. There are 7 girls and 8 boys in a group song. How many children are there in the group song?

8. There were 9 ducks in a pond, 7 more ducks came and joined them. How many ducks are there in the pond now?

9. I am a number 2 more than 5. Who am I?

10. What number added to itself gives 14.

UNIT 12

Subtraction Facts

Subtraction of one digit numbers from numbers up to 18, so that the answer is a one digit number are called subtraction facts.
These are very important for further learning. Students should acquire the automaticity of these.

Methods for Subtraction of numbers

We can subtract two numbers by using any of the following aids:

1. We can subtract 3 from 7 by setting aside 7 sticks and taking away 3 from these and counting the number of remaining sticks.
2. Or we draw 7 lines, then strike off 4 lines and count the number of remaining lines.

Properties of Subtraction

Properties of subtraction help us to find and memorize subtraction facts.

1. Subtract

5 – 0 = 5

7 – 0 =

8 – 0 =

2 – 0 =

10 – 0 =

15 – 0 =

What do you notice?
Subtracting 0 from any number gives the number.

2. Subtract

4 – 1 = 3

7 – 1 =

8 – 1 =

18 – 1 =

10 – 1 =

15 – 1 =

What do you notice?

Subtracting 1 from any number gives the number that comes just before it.

3. Find

7 – 4 =	7 – 3 =
3 – 2 =	3 – 1 =
4 – 1 =	4 – 3 =
5 – 2 =	5 – 3 =
9 – 2 =	9 – 7 =

What do you notice?

If we subtract the difference of two numbers from the larger number, we get the number that was subtracted.

4. Knowing the addition fact on the left, find the other facts.

4 + 2 = 6.	2 + 4 =	6 – 2 =	6 – 4 =
2 + 1 = 3	1 + 2	3 – 1 =	3 – 2 =
5 + 2 = 7	2 + 5 =	7 – 2 =	7 – 5 =
3 + 3 = 6	6 – 3 =		
5 + 4 = 9	4 + 5 =	9 – 5 =	9 – 4 =
8 + 6 = 14	6 + 8 =	14 – 8 =	14 – 6 =
8 + 7 = 15	7 + 8 =	15 – 8 =	15 – 7 =
7 + 6 = 13	6 + 7	13 – 6 =	13 – 7 =
9 + 6 = 15	6 + 9=	15 – 9 =	15 – 6 =
8 + 9 = 17	9 + 8 =	17 – 9 =	17 –8 =
9 + 9 = 18	18 – 9 =		

What do you notice?
Addition and subtraction facts are related.
If 4 + 5 = 9, then 5 + 4 =9, 9 – 4 = 5, 9 – 5 = 4
The facts that contain the same 3 numbers are called **fact families**
e.g. 4 + 5 = 9, 5 + 4 = 9, 9 – 4 = 5, 9 – 5 = 4.
Learning these together aids in quickly memorizing addition and subtraction facts.
You can use addition facts to check answers to subtraction problems.
For example, to check if 13 - 7 = 6 is correct, check if 6 + 7 = 13.

Exercise 12.1

Teacher can ask Q 1-5

1. Suppose you had 4 sticks, how many sticks should you remove to get 0 sticks
2. Suppose you had 5 sticks, how many sticks should you remove to get 5 sticks?
3. If you started with 8 sticks, what would be the smallest difference you could get by removing sticks? How would you get it?
4. If you started with 7 sticks, what would be the largest difference you could get by removing sticks? How would you get it?
5. Find

   12 - 1 =

   18 - 1 =

   10 - 1 =

   17 - 1 =

   20 - 1 =

6. Write all addition and subtraction facts using the numbers given below:

   3, 5, and 8→ 3 + 5 = 8 5 +3 = 8 8 - 5 = 3 8 - 3 = 5

   4, 5, and 9→

   6, 7, and 13→

   8, 9, and 17→

   7, 7, and 14→

7. Given the addition facts on the left find those on the right mentally

9 + 4 = 13	4 + 9 =	13 – 9 =	13 - 4 =
5 + 5 = 10	10 - 5 =		
4 + 6 = 10	6 + 4 =	10 - 6 =	10 - 4 =
5 + 6 = 11	6 + 5 =	11 - 6 =	11- 5 =
6 + 6 = 12	12 - 6 =		
8 + 7 = 15	7 + 8 =	15 – 8 =	15 - 7 =
9 + 7 = 16	7 + 9 =	16 – 9 =	16 - 7 =
5 + 8 = 13	8 + 5 =	13 - 8 =	13 - 5 =
8 + 9 = 17	9 + 8 =	17 - 9 =	17 - 8 =
9 + 9 = 18	18 - 9 =		
6 + 7 = 13	7 + 6 =	13 - 6 =	13 - 7 =
7 + 7 = 14	14 - 7 =		
7 + 5 = 12	5 + 7 =	12 - 5 = 5	12 - 7 =
6 + 9 = 15	9 + 6 =	15 - 9 =	15 - 9 =
8 + 8 = 16	16 - 8 =		
8 + 6 = 14	6 + 8 =	14 - 6 =	14 -8 =

Exercise 12.2

Subtract 7 - 3

```
------
```

```
 13
- 6
------
```

```
------
 12
- 4
------
```

```
------
 6
- 4
------
```

```
 9
-1
------
```

```
------
 10
- 3
------
```

```
------
 5
- 1
------
```

```
 7
- 4
------
```

```
------
 9
- 3
------
```

```
------
 6
- 2
------
```

```
 12
- 7
------
```

```
------
 13
- 5
------
```

```
------
 7
-1
------
```

```
 10
- 1
------
```

```
------
```

```
------
```

```
 11
- 3
------
```

14	17	12
- 4	- 8	-6
------	------	------
------	------	------
15	18	10
- 8	- 9	-5
------	------	------
------	------	------
17	13	10
-9	- 6	-6
------	------	------
------	------	------
13	12	15
-4	-6	-9
------	------	------
------	------	------
12	11	14
-9	-5	-8
------	------	-----
------	------	-----
14	10	16
- 5	-7	-7
------	------	------
------	------	------

17	16	10
-8	-8	-4
------	------	------
------	------	------
11	18	13
-4	-9	-3
------	------	------
------	------	------
10	12	10
-6	-4	-8
------	------	------
------	------	------
13	15	13
-8	-6	-7
------	------	------
------	------	------
14	17	15
-2	-5	-4
------	------	------
------	------	------
11	13	11
-7	-9	-8
------	------	------
------	------	------

14	16	11
-7	-7	-2
------	------	------
------	------	------
16	14	15
- 9	-3	-7
------	------	------
------	------	------
13	11	17
-8	-2	-9
------	------	------
------	------	------
12	13	12
-3	-7	-3
------	------	------
------	------	------
16	15	11
-7	-8	-6
------	------	------
------	------	------
10	13	12
-9	-6	-4
------	------	------
------	------	------

```
                                                  ------
11          14
-5           -8                                   ------
------      ------                                15
                                                  -7
------      ------                                ------
10          12
 -2          -5                                   ------
------      ------

------      ------
15          17
-3          -3
------      ------

------      ------
18          11
-4          -9
------      ------

------      ------
17          15
-6          -2
------      ------

------      ------
14          12
-9          -8
------      ------

------      ------

            13
            -4
```

Exercise 12.3

Teachers can read these questions and ask students to write addition or subtraction equations and read the equations.

1. There were 5 birds sitting on a tree and 2 birds flew away. How many birds are on the tree now?
2. Sunita had 6 bangles, 2 of which broke, how many bangles does she have now?
3. Avani had 5 dolls. She got 8 more dolls on her birthday. How many dolls does she have now?
4. Rajiv had 4 toffees, he ate 2 of them. How many toffees does he have now?
5. There were 15 children in a group dance. If 7 of these are boys, how many girls are in the dance?
6. Anil has 7 toys while Sunil has 10 toys. Who has more toys and how many more?
7. Ranjana has 6 rupees less than her brother. If her brother has 14 rupees how many rupees does Ranjana have?
8. There are 7 crows and 6 sparrows on a tree. How many birds are on the tree?
9. Anita has 8 rupees; she wants to buy a book costing 17 rupees. How many more rupees does she need?

UNIT 13

Measurement

Concepts of height, length, and thickness

Height

1. Ask children to compare the height of readily available objects in the environment such as children, plants, children's desk and teacher's table by asking questions such as:
   Tell which of the two specific objects is taller?
   Tell which of the two specific objects is shorter?
   Point to two objects that are about the same height?

2. Compare the sets of objects given below and place a √ under the object that is taller.

3. Compare the sets of objects given below and place a √ under the

object that is shorter.

Length

Give examples of short and long objects.
Ask children to compare the length of readily available objects in the environment such as pencil and pen, crayons of different lengths. Draw lines and arrows on the blackboard and ask which of them is longer or shorter.

Compare the length of sets of objects given below and place a √ under the object that is longer.

Compare the length of sets of objects given below and place a √ under the object that is shorter.

1. Cut a strip of paper or cardboard that is as long as your little finger, call this "chichi".
2. How many chichis long is your nose?
3. Tell the length and breadth of your math's book using the chichi.
4. Measure the length, width and height of your desk using your hand span.
5. Estimate(guess) the length of your notebook, pencil in terms of your chichies, and then measure it to check how good your estimate was.

Thickness

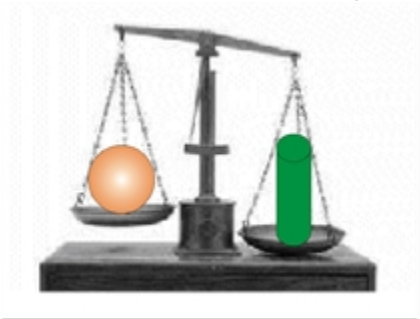
Ask children to compare the thickness of readily available objects in the environment such as pens, pencils, crayons, chalk by asking questions such as:
Tell which of the two specific objects is thicker?
Tell which of the two specific objects is thinner?
Are there any objects that are about the same thickness?
Compare the sets of objects given below and place a √ under the object that is thicker or wider.

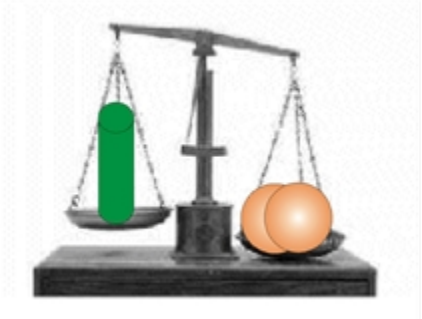
Compare the sets of objects given below. Place a √ under the object that is thinner or narrower.

Glue Stic
• Washable
• Acid Free
AVERY
Glue Stic
• Washable
• Acid Free
AVERY

Weight

Show the video: https://youtu.be/qUOQrXmfwDM
Ask students to take out two objects of different weight from their school bag, one in each hand and ask the student to tell which one weighs more and which one weighs less.
The object that weighs more is called **heavier**.
The object that weighs less is called **lighter**.
You can also tell what weighs more by using a balance. The side of the balance with heavier objects goes down.





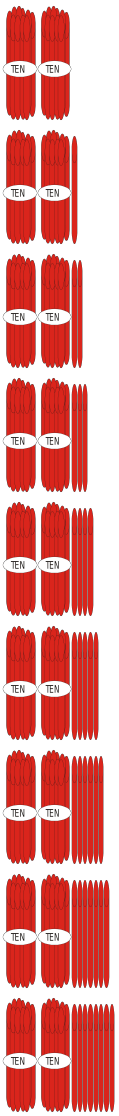
The scale on the left shows one cylinder is heavier than the sphere.
The scale on the right shows one cylinder is lighter than two spheres.

We can weigh and compare the weight of objects by using marbles of the same size till both sides balance. The number of marbles required for both pans to be at the same level is the weight of the object. The object that requires more marbles is heavier. How much one object is heavier than the other can be determined by the difference in the number of marbles. Demonstrate by weighing readily available objects.

UNIT 14

Numbers 20-100

We have learnt numbers from 0 to 20. The numbers can be extended further to enable us to find the number of objects in larger collections as the number of objects increases by one. The number names as number of objects increases by one are given below:



20-Twenty

20 + 1- Twenty one

20 + 2-Twenty two

20 + 3-Twenty three

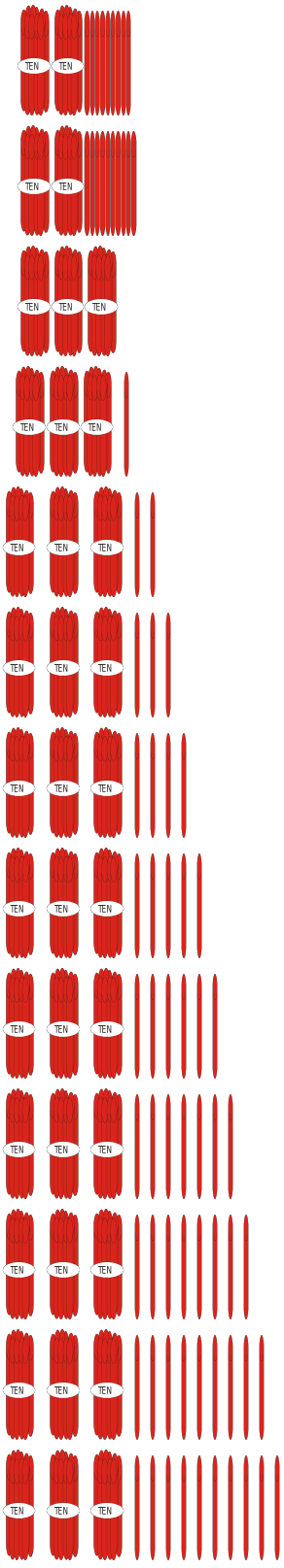
20 + 4-Twenty four

20 + 5-Twenty five

20 + 6-Twenty six

20 + 7-Twenty seven

20 + 8-Twenty eight



20 + 9-Twenty nine

20 + 10-Thirty or

Three tens

30 +1 = 31-Thirty one

30 + 2 = 32-Thirty two

30 + 3 = 33-Thirty three

30 + 4 = 34-Thirty four

30 + 5 = 35-Thirty five

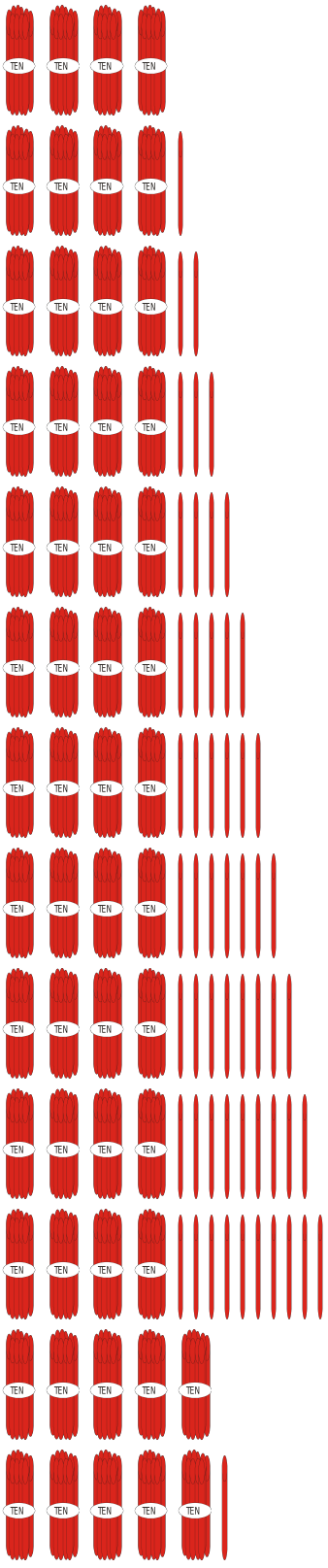
30 + 6 = 36-Thirty six

30 + 7 = 37-Thirty seven

30 + 8 = 38-Thirty eight

30 + 9 = 39-Thirty nine

30 + 10 = 40-Forty or



Four tens

40 + 1 = 41-Forty one

40 + 2 =42-Forty two

40 + 3 =43-Forty three

40 + 4 =44-Forty four

40 + 5 =45-Forty five

40 + 6 =46-Forty six

40 + 7 =47-Forty seven

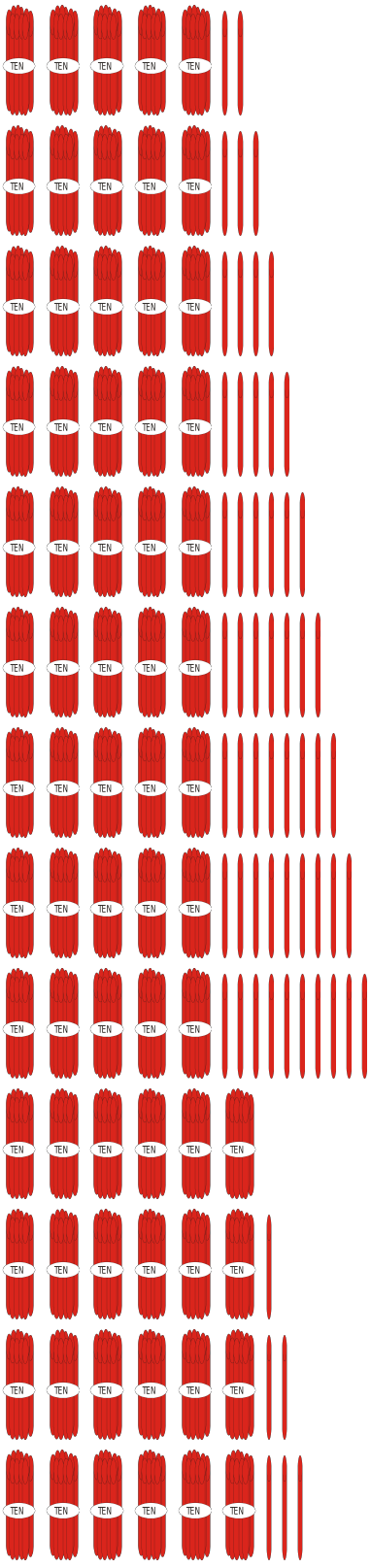
40 + 8 =48-Forty eight

40 + 9 =49-Forty nine

40 + 10 =50-Fifty or

Five tens

50 + 1 = 51-Fifty one



50 + 2 = 52-Fifty two

50 + 3 = 53-Fifty three

50 + 4 = 54-Fifty four

50 + 5 = 55-Fifty five

50 + 6 = 56-Fifty six

50 + 7 = 57-Fifty seven

50 + 8 = 58-Fifty eight

50 + 9 = 59-Fifty nine

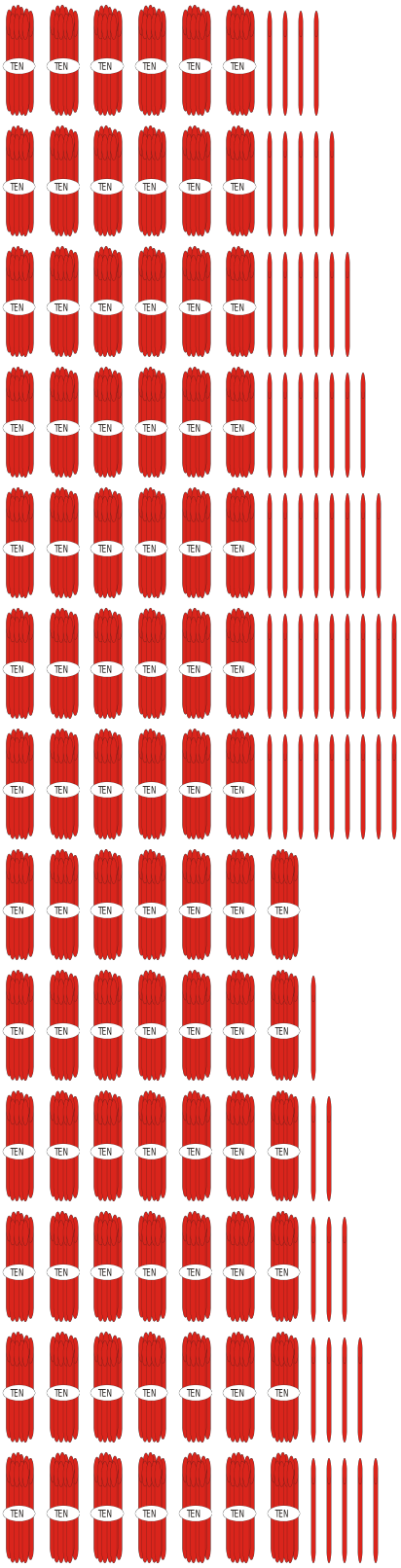
50 + 10 = 60-Sixty or

6 Tens

60 + 1 = 61-Sixty one

60 + 2 = 62-Sixty two

60 + 3 = 63-Sixty three



60 + 4 = 64-Sixty four

60 + 5 = 65-Sixty five

60 + 6 = 66-Sixty six

60 + 7 = 67-Sixty seven

60 + 8 = 68-Sixty eight

60 + 9 = 69-Sixty nine

60 + 10 = 70 or

7 Tens

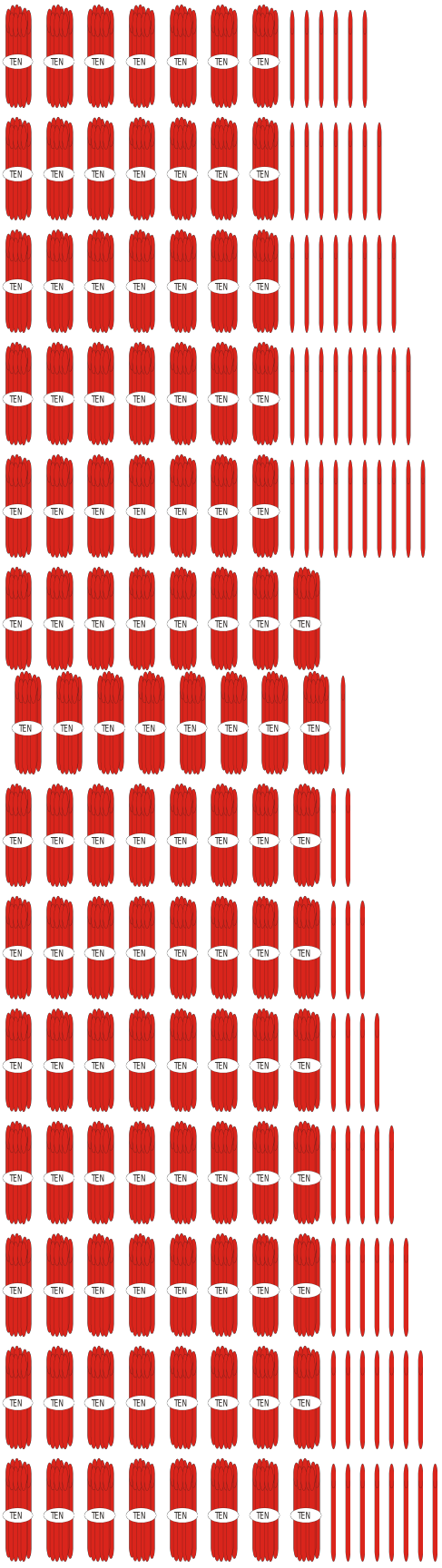
70 + 1 = 71-Seventy one

70 + 2 = 72-Seventy two

70 + 3 = 73-Seventy three

70 + 4 = 74-Seventy four

70 + 5 = 75-Seventy five



70 + 6 = 76-Seventy six

70 + 7 = 77-Seventy seven

70 + 8 = 78-Seventy eight

70 + 9 = 79-Seventy nine

70 + 10 = 80-Eighty or

80 + 1 = 81-Eighty one

80 + 2 = 82-Eighty two

80 + 3 = 83-Eighty three

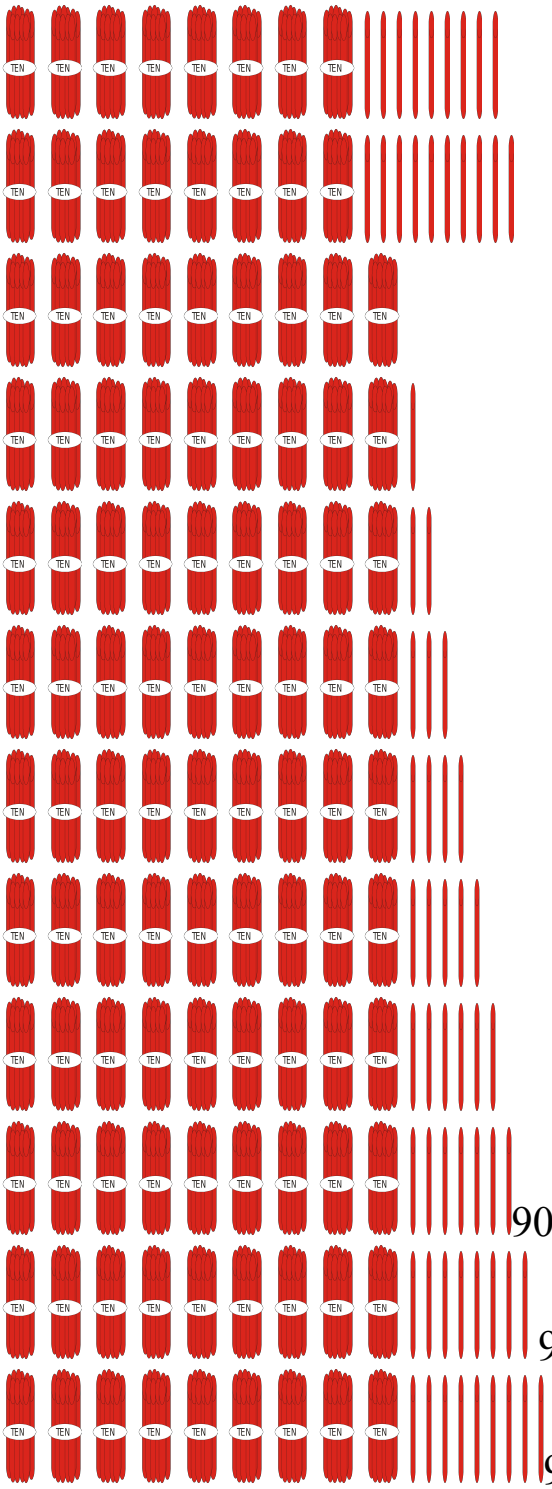
80 + 4 = 84-Eighty four

80 + 5 = 85-Eighty five

80 + 6 = 86-Eighty six

80 + 7 = 87-Eighty seven

80 + 8 = 88-Eighty eight



80 + 9 = 89-Eighty nine

80 + 10 = 90 or

9 Tens

90 + 1 = 91-Ninety one

90 + 2 = 92-Ninety two

90 + 3 = 93-Ninety three

90 + 4 = 94-Ninety four

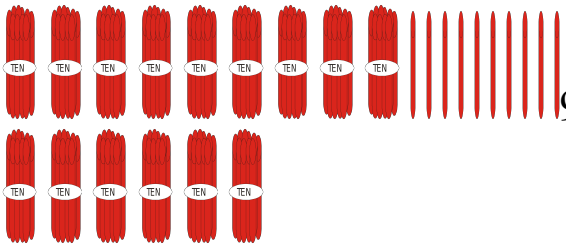
90 + 5 = 95-Ninety five

90 + 6 = 96-Ninety six

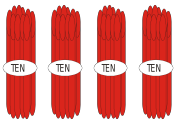
90 + 7 = 97-Ninety seven

90 + 8 = 98-Ninety eight

90 + 9 = 99-Ninety nine



90 + 10 = 100-Hundred



10 Tens

As we have 10 tens, we need to group them again into a group of 10 tens and give it a name. We name it one **hundred** and write it as 100.

As tens were placed to the left of ones, we write 1 for one hundred to the left of tens place and name that **hundreds** place.

As there are no ten sticks or single sticks left, we write zeros in tens and ones place.

The Hundred Table

We can also write the numbers in order from 1 to 100 in a table

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1. Read all the numbers from left to right beginning with the first row from 1 to 100. This is called counting from 1 to 100.

2. Read the last column-10, 20, 30, 40, 50, 60, 70, 80, 90 and 100. This is called **counting by ten** from 10 to 100.

3. Shade every fifth number up to 100 - 5, 10, 15, 20, 25, 30, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85,90, 95, 100. This is called **counting by five**.

4. We can similarly count by two by reading alternate numbers – 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20. This is called **counting by two** from 2 to 20.

Writing numbers in terms of tens and ones

We can also write numbers in terms of tens and ones in the number.
As each number has a number of bundles of ten sticks and single sticks. For example, 25 has 2 bundles of ten-sticks and 5 single sticks, we can write
25 = 2 tens + 5 ones.
Similarly, we can write
38 = 3 tens + 8 ones
40 = 4 tens + 0 ones
7 = 0 tens + 7 ones

Exercise 14.1

1. Count up to 100. Provide practice in it till students are fluent in it.
2. Write numbers up to 100 in the table given below:

Hundred Table

1									
									100

3. Write missing numbers in the hundred chart

1	2	3		5	6	7	8	9	10
11	12	13	14	15	16		18	19	20
21	22	23		25	26	27	28		30
31	32	33	34	35		37	38	39	40
41	42	43	44		46	47	48	49	
51	52		54	55	56	57	58	59	60
61	62	63	64	65	66		68	69	70
71	72	73		75	76	77	78	79	80
81	82	83	84	85		87	88	89	
91	92	93	94	95	96	97		99	100

4. Count the number of girls and boys in the class.

5. Count numbers by 10 up to 100.

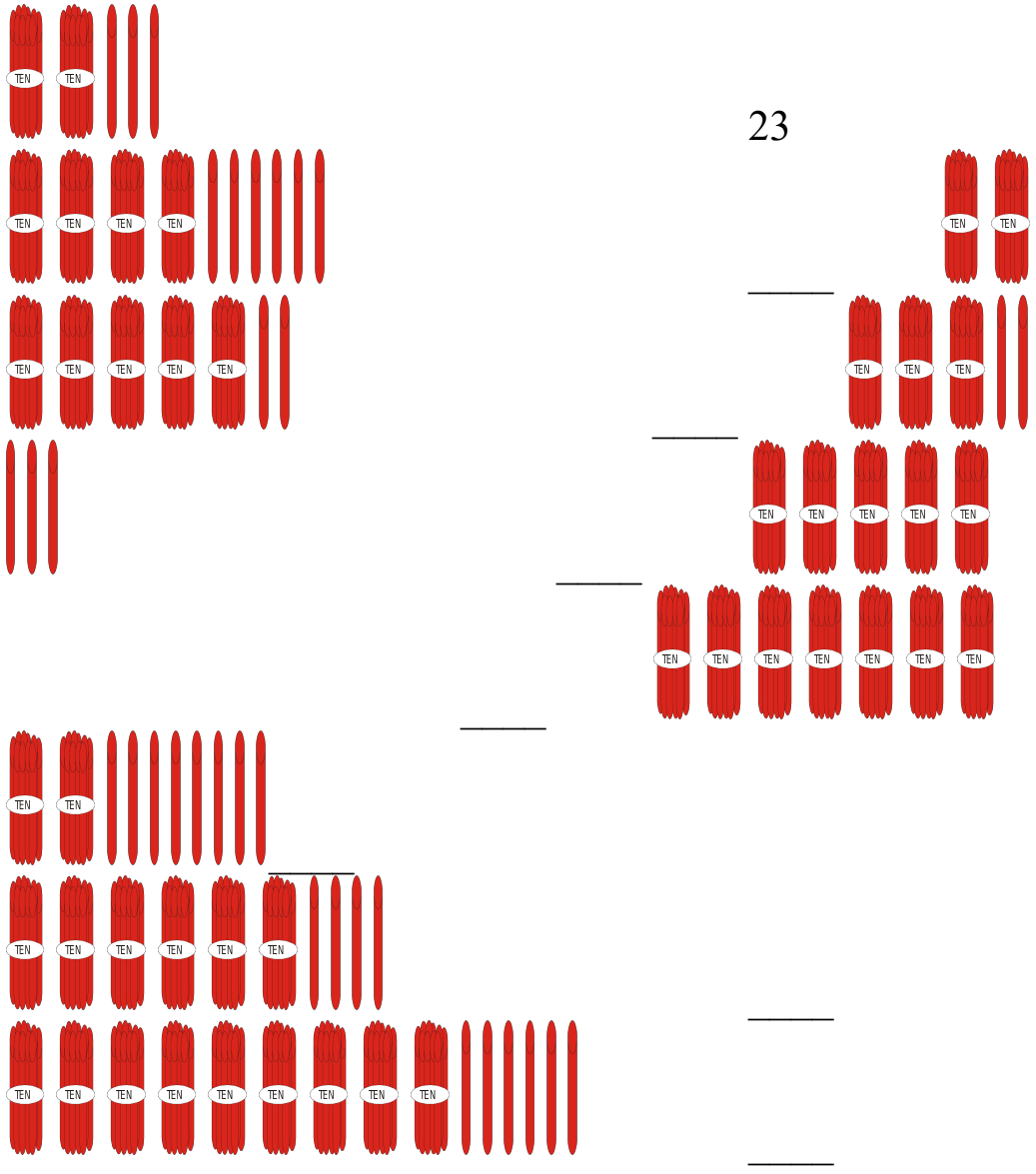
6. Count numbers by 5 up to 50.

7. Count numbers by 2 up to 20.

8. Set aside the following numbers of sticks using bundles of ten-sticks and single sticks.
   6, 14, 19, 35, 37, 48, 52, 60, 78, 84, 98, 100

9. Read the following numbers:
   6, 12, 14, 39, 56, 72, 43, 27, 79, 58, 86, 90, 31, 66 and 100.

10. A number of ten bundles of sticks and some loose sticks are given below write the total number of sticks against them:



11. Write the following numbers (To be dictated by the teacher):
    9, 18, 23, 38, 54, 67, 90, 82, 46, 59, 41, 75, 14, 28 and 40.

12. Write 4 numbers in counting that come after the numbers given below:
6 - 7, 8, 9, 10

12

19

28

79

13. Write 4 numbers in counting back from the numbers given below:

10 - 9, 8, 7, 6

9 -

20 -

28 -

70 -

80 -

100 -

14. Write the following numbers as sum of tens and ones:

35 = 3 tens + 5 ones

13 = ___ten + ___ones

45 = ___tens + ___ones

69 = ___tens + ___ones

27 = ___tens + ___ones

75 = ___tens + ___ones

60 = ___tens + ___ones

8 = ___ tens + ___ones

16. Write the numbers for the following:

2 tens + 5 ones = 25

7 tens + 4 ones =

9 tens + 9 ones =

6 tens + 2 ones =

2 tens + 8 ones =

Exercise 14.2

Write numbers that come just after the following numbers

0	
5	
9	
13	
15	
12	
19	
21	
23	
92	
29	
35	
39	
42	
49	
54	
59	
68	
69	
76	
79	
80	
89	

Write numbers that come just before the following

	2
	3
	8
	10
	17
	20
	24
	30
	33
	37
	39
	40
	44
	47
	50
	63
	70
	75
	80
	92
	66
	88
	90

Write numbers that come between the following numbers

1		3
6		8
15		17
36		38
39		41
54		56
70		72
58		60
42		44
36		38
88		90
73		75
20		22
33		35
39		41
42		44
56		58
61		63
64		66
77		79
85		87
89		91
93		95

Comparison of Numbers

The number that comes later in counting is larger. For example, 31 comes after 23 in counting, therefore 31 is greater than 23. We write it as $31 > 23$.
The number that comes earlier in counting is smaller. As 8 comes before 11, 8 is less than 11. We write it as $8 < 11$.
Alternatively, we can express numbers in terms of tens and ones and compare the number of tens; a number with a larger number of tens is larger. For example, to compare 48 and 63, we write
48 = 4 tens + 8 ones
63 = 6 tens + 3 ones
As the number of tens in 63 is large, $63 > 48$.
If the number of tens in both numbers is the same, then the number with a larger number of ones is larger. For example, 36 and 32 both have 3 tens, but 36 has 6 ones and 32 has 2 ones. As $6 > 2$ therefore $36 > 32$.

Exercise 14.3

Compare the following numbers by writing < or > or = between the following numbers:

9		4
22		26
35		35
99		100
21		25
36		22
14		17
15		19
1		4

5		7
19		18
36		42
78		78
48		50
35		61
85		72
17		17
56		56

UNIT 15

Money

We need money to buy things. Different countries have different names for money. In India we use **rupees**. It is now called INR, but we will continue to use rupees as that is commonly used. The worth of a note or coin is called its **denomination.** Notes of denomination of rupees 1, 2, and 5, and 10 are available in notes as well as coins. The coins and notes of various denominations up to Rs. 100 are given below:

Notes and coins of different denominations

Finding the amount of money for many notes of different denominations

The teacher can demonstrate by using fake money.

If we have several ten-rupee notes we can find the amount of money we have by counting by ten. For example, if we have 7 ten-rupee notes, we count by ten-10, 20, 30, 40, 50, 60 and 70, saying each number as we set aside each note. The last number we say is 70 gives us the amount of money.

If we have several five-rupee notes we can find the amount of money we have by counting by five. For example, if we have 5 five-rupee notes, we count by five-5, 10, 15, 20 and 25 as we set aside each note till no notes are left. The last number that we say 25 gives us the amount of money.

If we have several two-rupee notes we can similarly find the amount of money we have by counting by two. For example, if we have 6 two-rupee notes, we count by two-2, 4, 6, 8, 10 and 12. The last number 12 gives us the amount of money.

If there are several notes of different denominations we can find the amount of money by first counting notes of the same denomination separately and then adding them. We can also first count the higher denomination and then count by a number equal to the value of lower denomination notes. The last number would give the amount of money. For example, if we have 3 ten-rupee notes and 2 five 5-rupee notes, we first find the worth of 3 ten- rupee notes by counting by ten-10, 20, and 30 and then the worth of 2 five- rupee notes by counting by 5-2 numbers 5 and 10 then add 30 and 10 to find the total amount of money. As 30 + 10 = 40, the total amount of money is 40 rupees.
We can also count by 5 two numbers beginning with 30 e.g. 35, 40. As the last number is 40, the total amount of money is 40.

Exercise 15.1

Write the total amount of money for the given notes

_____

_____

भारतीय रिज़र्व बैंक
RESERVE BANK OF INDIA
2DA*012720
50
पचास रुपये
I PROMISE TO PAY THE BEARER THE SUM OF FIFTY RUPEES
GOVERNOR
2DA*012720

भारतीय रिज़र्व बैंक
RESERVE BANK OF INDIA
4AB 245180
100
एक सौ रुपये
I PROMISE TO PAY THE BEARER THE SUM OF ONE HUNDRED RUPEES
GOVERNOR
4AB 245180

Exercise 15.2

Set aside the following notes using paper money and find the total worth of these (or if paper money is not available, find the amount of money the person would have who has the following notes) and write it in the box given against them:

1. 4 one-rupees notes
2. 6 two-rupees notes
3. 3 five-rupees notes
4. 5 ten-rupees notes
5. 3 two-rupees notes and 2 one-rupees notes
6. 4 ten-rupees note and 3 one-rupees notes
7. 2 five-rupees notes and 2 one-rupees notes
8. 4 ten-rupees note and 2 two-rupees notes
9. 2 ten-rupees note and 3 five-rupees notes
10. 3 five-rupees note and 4 one-rupees notes
11. 1 twenty-rupee note and 3 two rupee notes
12. Show the following amounts of money in two ways by using notes of different denominations using fake money:
    (a) Rs. 3

    (b) Rs. 8

(c) Rs. 30

(d) Rs. 25

(e) Rs. 22

UNIT 16

Collection and Organisation of Data

Activity 1

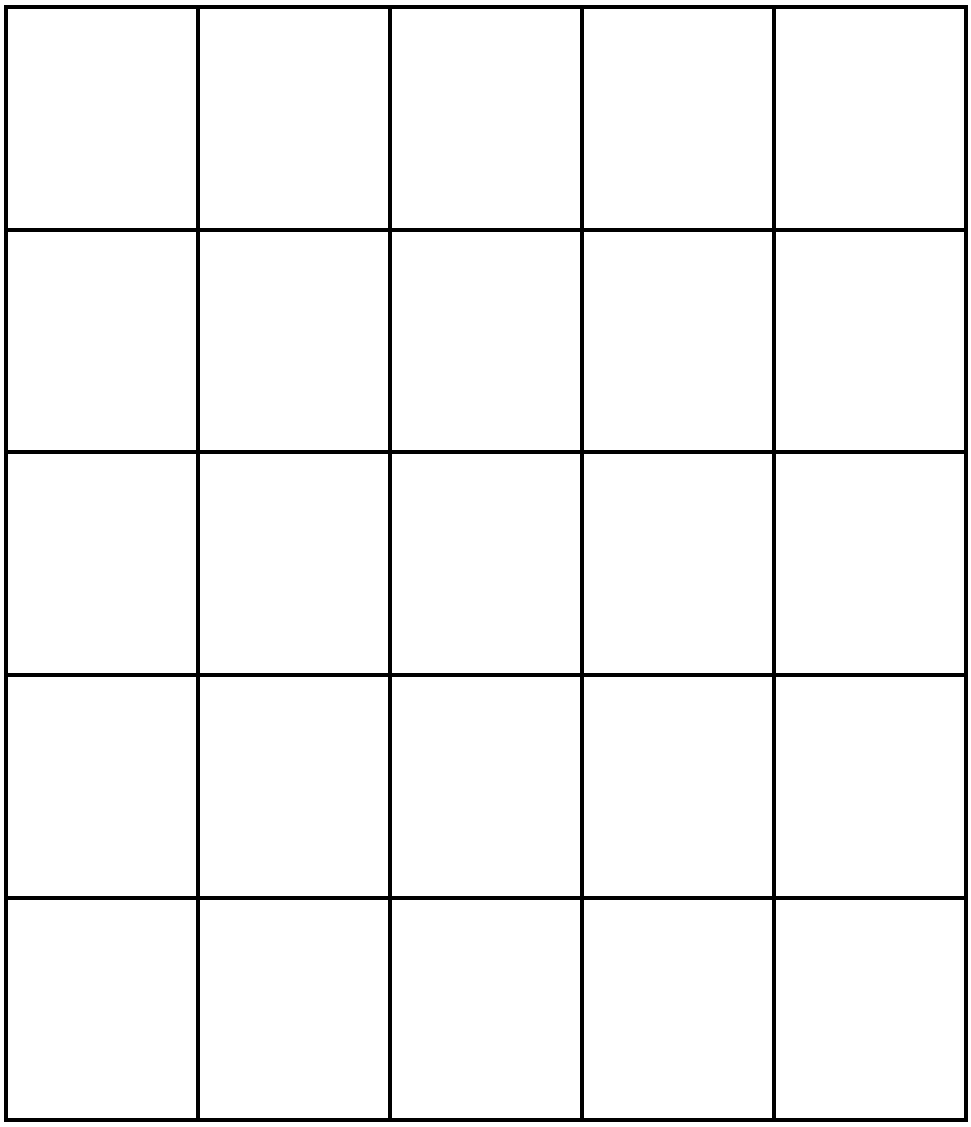
The teacher can take any collection of objects such as pattern blocks, chips, or other objects and asks one student to describe one property of the object; other students to describe some other property of the object that has not been described before. Teacher writes these properties on the blackboard.
Teacher then asks students to sort a group of objects into groups that are similar in some way.

Activity 2

The teacher can ask them to cut the figures from the activity sheet 16.1 along the border and sort them according to color and paste them in the table given below, giving the name of the colour in the first row of different columns.

Activity 3

The teacher can ask them to cut the figures from the activity sheet 16.1 along the border and sort them according to shape and paste them in the table given below. Give the name of the shapes in each column of first row



Teacher demonstrates how to organise each group into columns on a paper with squares (large enough to fit the objects) so that items similar in regard to a property are in the same column. Make sure that there is only one object in each square.
The teacher can then ask
What property was used to sort the objects?
What name would be appropriate for each column?
How many objects are there in columns with different names?
Which column has the most objects?
Which column has the least objects?
Are there any columns with the same number of objects?

What is the total number of objects?
Can we sort these objects in a different way? If yes, how?
Repeat with a different property.

Activity 4

Divide the class into groups and assign students to cut paper strips equal to the length of their hand span in group 1, a specific finger in group 2, pencils of students in the group, and so on.
Ask them to arrange these in order of length and ask questions such as
Who has the longest hand span or the specific finger, or pencil?
Who has the shortest hand span or the specific finger or pencil?
Name a pair of students who have the same length of hand span or specific finger or pencil?

Activity 5

The teacher can ask each student the name of their favourite toy/ type of toy, and write these on the board.
Ask students to count the number of toys in each category and write in the table given below. In the first row name the category and under that the number of students who prefer it.

The teacher can then ask questions like the ones given below:
1. What toy/type of toy is preferred by the most number of students?
2. What toy/type of toy is preferred by the least number of students?
3. How many more prefer a toy than another toy?

UNIT 17

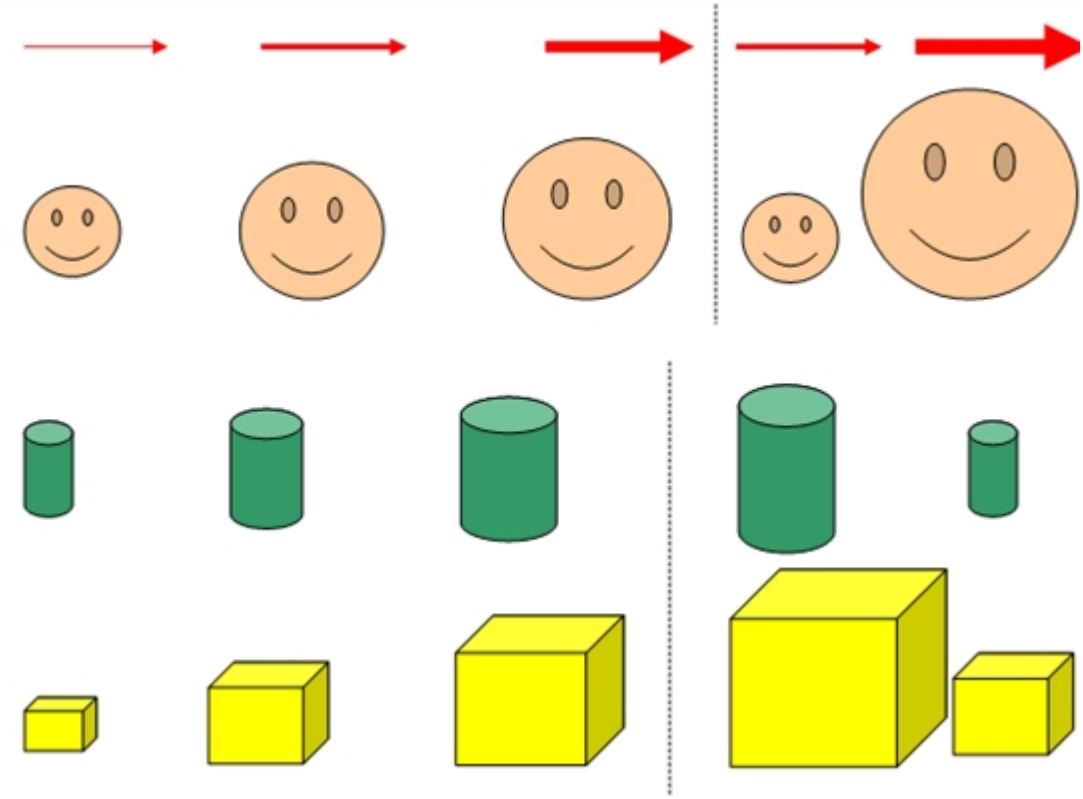
Patterns

Watch the video: https://youtu.be/wfAyddSr9_w
Show patterns like the ones given below and ask them to
(a) continue it.
(b) describe it.

1. Clapping of hands in a certain way.
2. Stamping of feet in a certain way.
3. Arranging blocks or chips of different colours in a certain way.
4. Arranging blocks or chips of different shapes in a certain way.
5. A, B, A, B…
6. ABC, ABC, ABC,…
7. A,B,C,…
8. 1, 2, 3,...
9. 2, 4, 6, …
10. 11, 9, 7, ...

Exercise 17

1. Look at the pattern of pictures on the left of the line and mark a under one of the pictures on the right that will come next and describe the pattern orally:



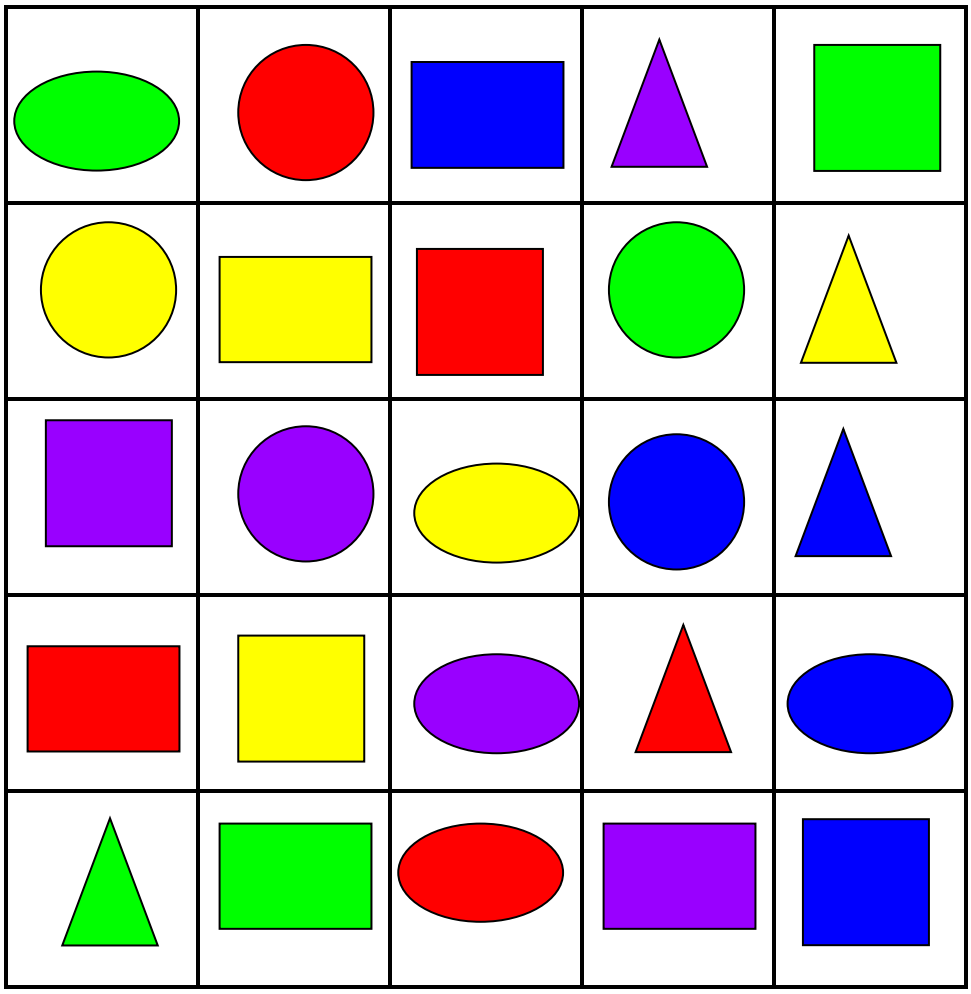
Write the next term using the pattern

2. A, B, C, D, …
3. AB, AB, AB, AB, …
4. A, C, E, F, …
5. 9, 8, 7, 6, ...
6. 1, 3, 5, 7, …
7. 13, 11, 9, 7, …
8. 5, 10, 15, 20, …

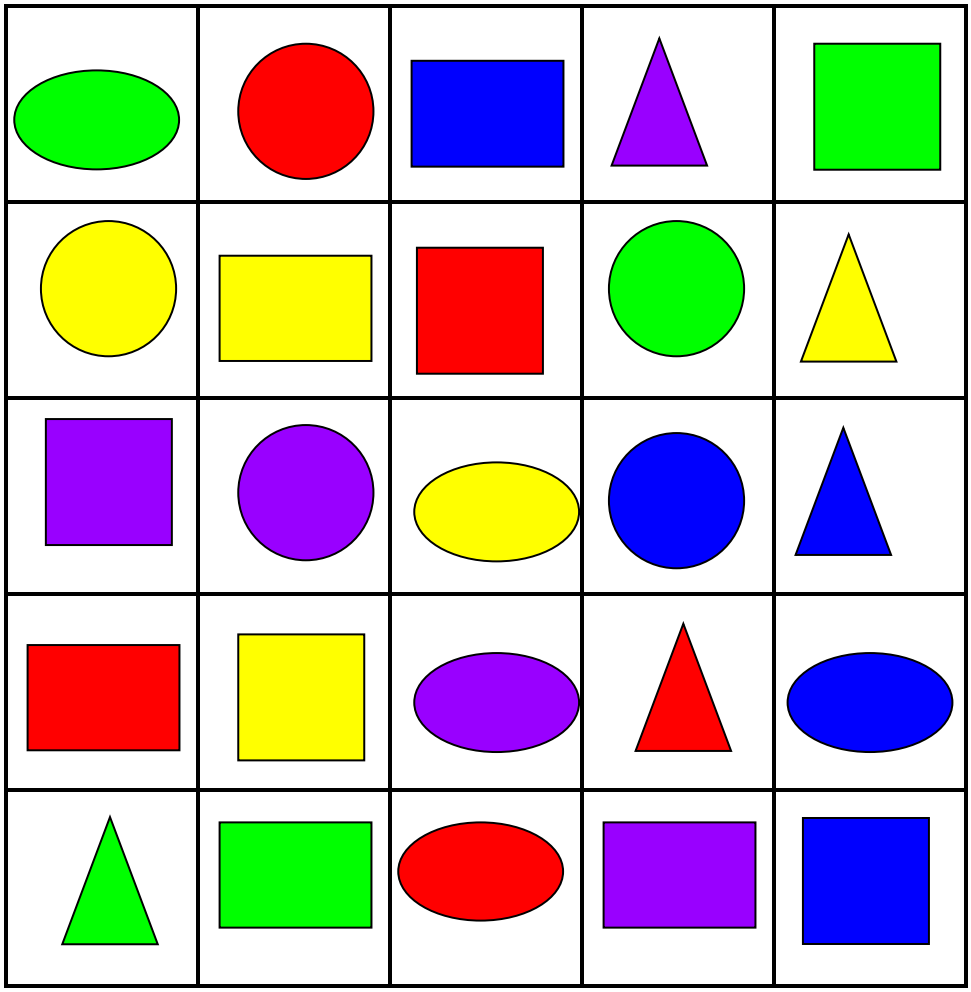
9. 2, 5, 8, 11, ...
10. Make a pattern by using blocks, letters, and numbers(if you do not have blocks, you can draw shapes) and describe it.
11. Copy a pattern made by a student sitting on your left.

ACTIVITY SHEETS

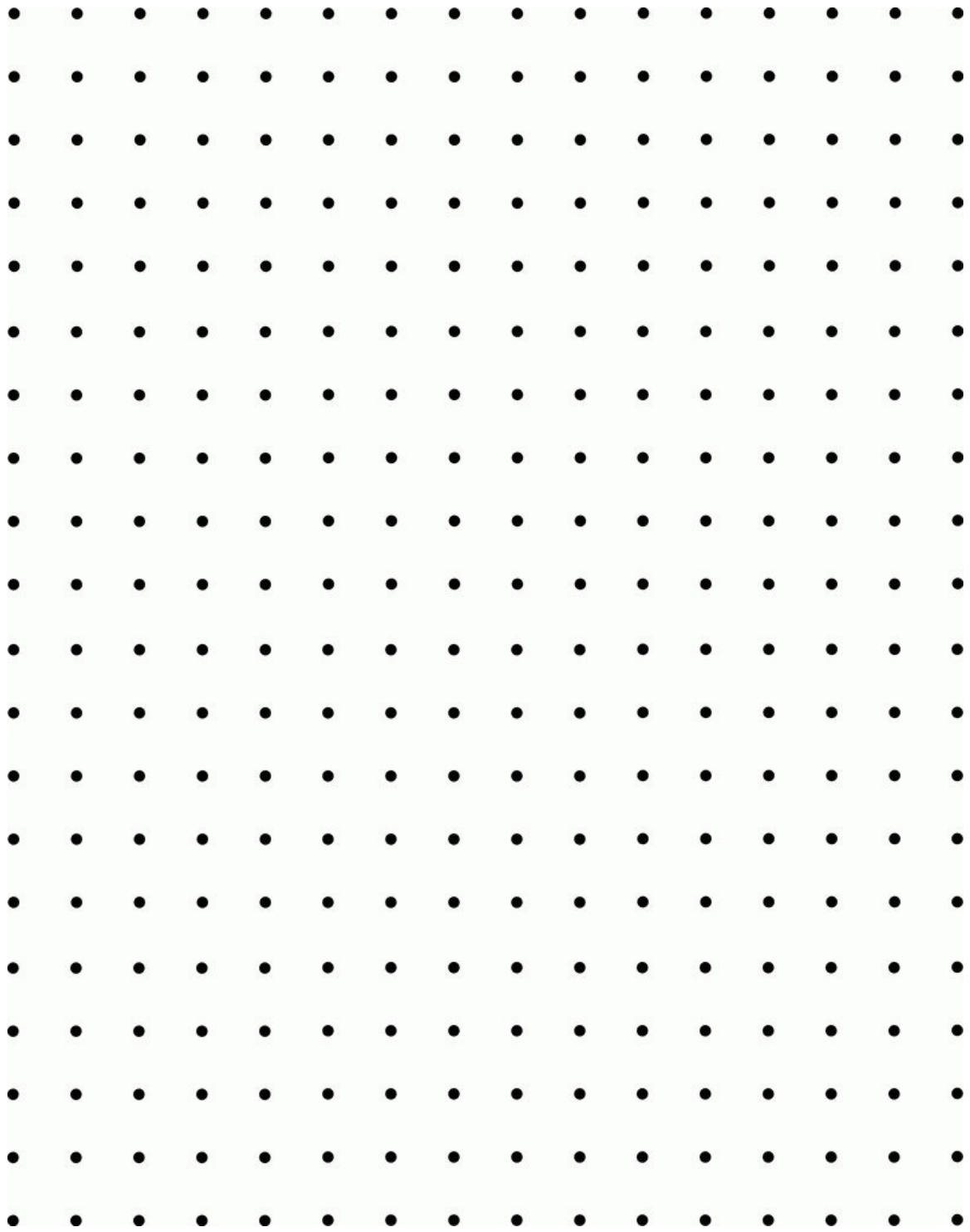
Activity Sheet 1.1

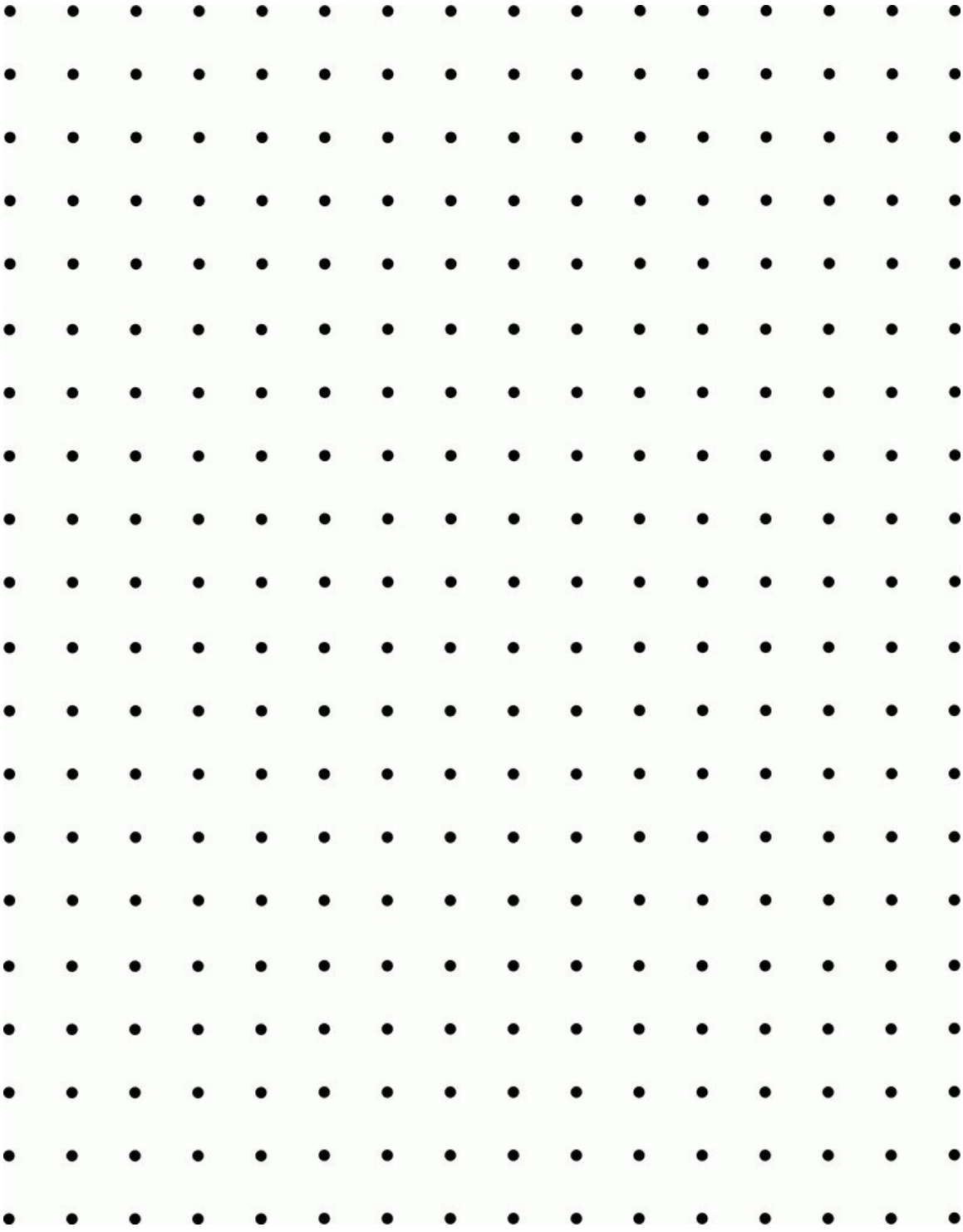


Activity Sheet 1.2

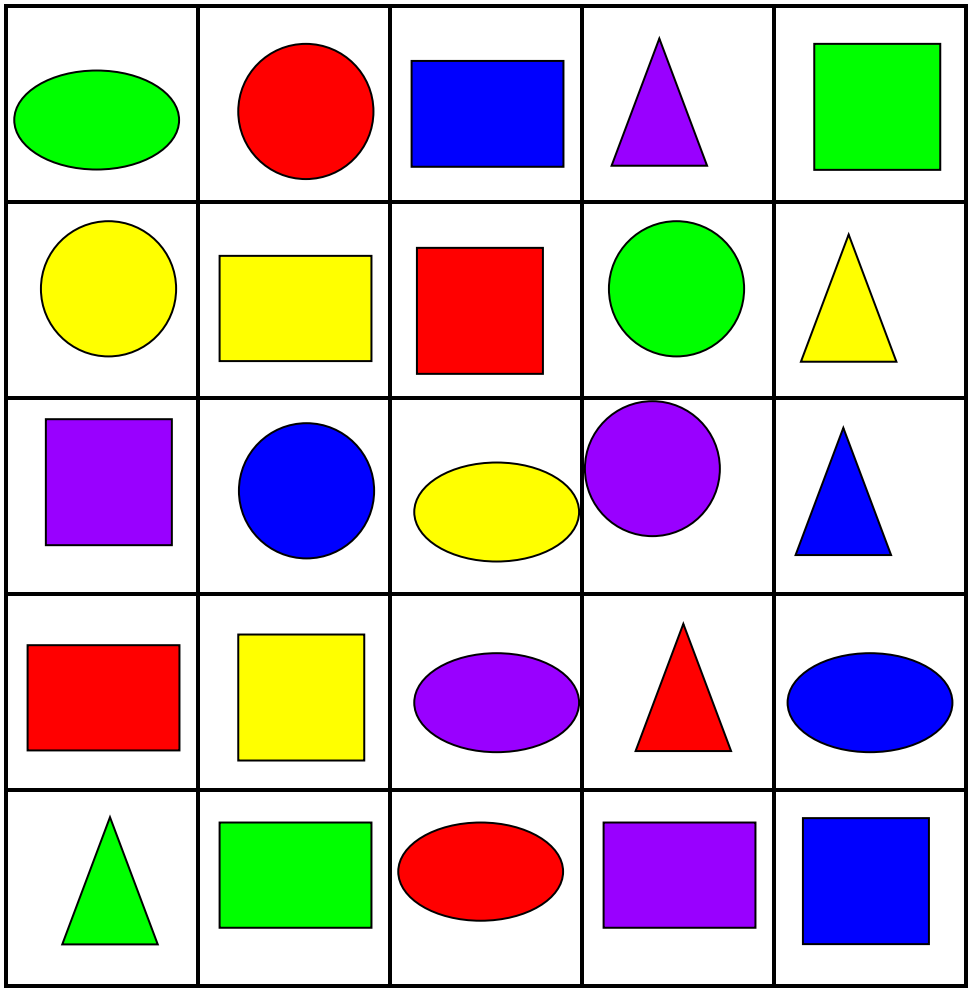


Activity Sheet 10





Activity Sheet 16.1



Activity Sheet 16.2